October 12, 1929 A McGraw-Hill Publication 20 Cents per Copy

AVIATION

The Oldest American Aeronautical Magazine

Start OF THE 1929 NATIONAL AIR TOUR

THE NATIONAL *Safety* COUNCIL MEETING

SELLING AND SERVICING *Parachutes*

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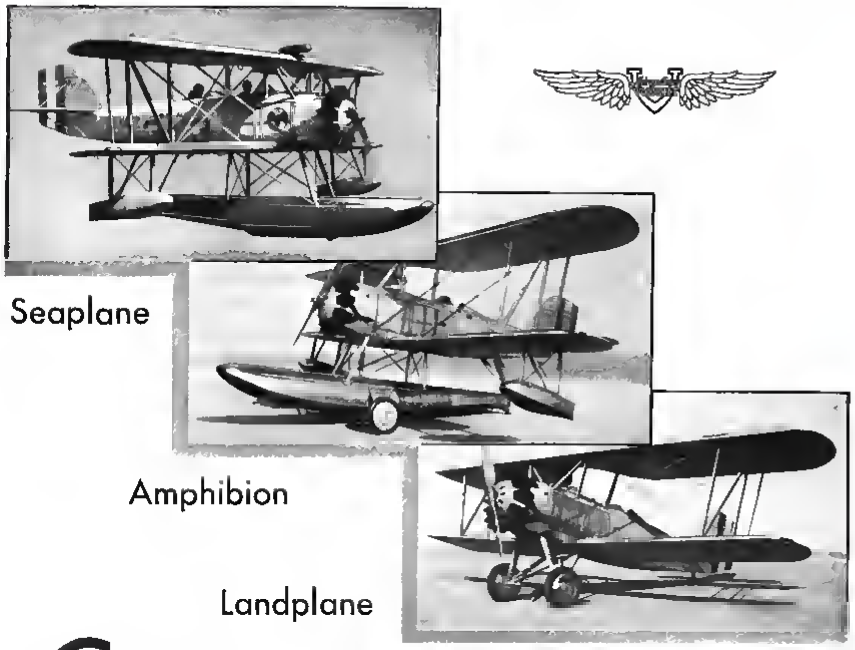

Corsair miles in the air are in the millions

In all three types, Corsairs enjoy a military background of trustworthy performance which may well serve as a guide to the purchaser seeking the highest grade ship for commercial or sport use. Corsairs have rapid climb, an exceptional speed range and ease of control peculiarly their own.

As seaplanes, Corsairs thrive under exacting service with the Navy and Marine Corps. As amphibions, developed for use on the new aircraft carriers, Corsairs offer all the speed, performance and control of their famous line.

As landplanes, Corsairs are giving an equally fine account of themselves. Acceptable enough in ordinary flying, Corsair characteristics are doubly welcome when coming into or taking off from small fields with heavy loads.

Powered with the dependable Wasp engine the Corsair is the ideal ship—not alone for military purposes, but for commercial and private use as well.

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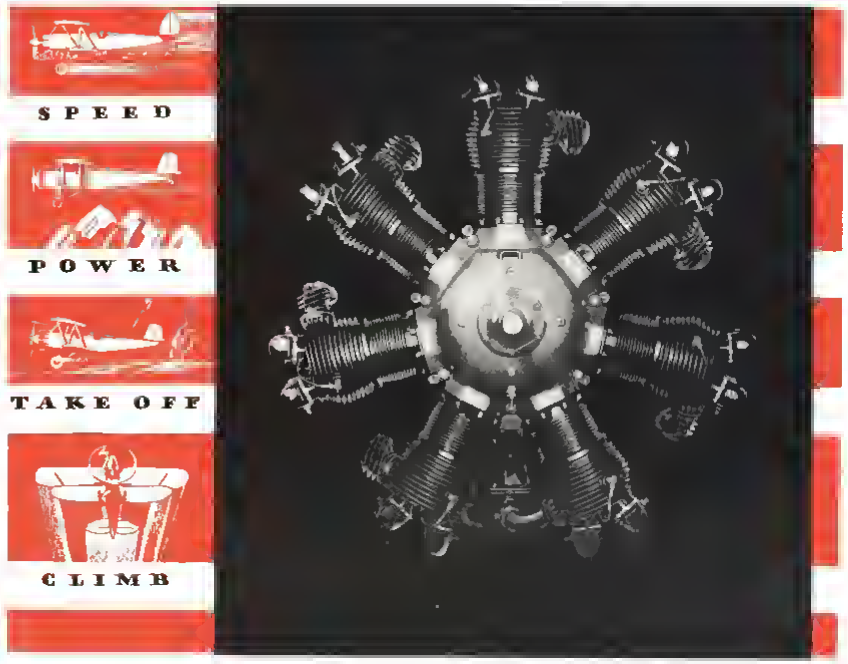
DIVISION OF UNITED AIRCRAFT & TRANSPORT CORPORATION

Long Island City, New York



THE *Improved* SPORT PLANE ENGINE

Give your sport plane *ALL* the advantages of *power*, *speed* and *fast climbing* Specify the engine that's designed primarily for sport plane service. The improved Axelson Engine Type B will give any sport plane new life, new performance, finer control Expect more service from an Axelson! *You'll get it.*

Axelson Aircraft Engine Co.
Factory and General Offices
Corner Randolph St and Boyle Avenue
Los Angeles, California
(P O Box 337)

AXELSON AIRPLANE ENGINES

In beauty, style and luxury your planes need reach no "ceiling"

Du Pont aircraft finishes offer unlimited possibilities of originality in styling—give your ships an individual smartness

WITH the modern high development of mechanical design in aircraft—greater emphasis must now be placed on color, beauty, *styling*. In ships for private owners, beauty and convenience attain the same importance that they hold in motor car design. Commercial passenger planes demand the same comforts and luxury of fittings that are found in buses, yachts and pullman cars.

To aid the aircraft manufacturer in this intensive styling of his planes, du Pont provides a complete line of finishes and unusual finishing materials specially designed for air service. For wings—clear dopes, pigmented dopes, standard Army and Navy finishing materials. For fuselage—Duco, fuselage varnish and spar varnish. For other wood and metal parts—special primers and sealers, aircraft enamels, dopeproof paints and lacquers. In fact for every part of the ship, the du Pont line provides a finish in its highest stage of modern development.

Style Experts At Your Service

The du Pont organization maintains a special department for the study of color trends and color fashions. The du Pont Color Advisory Service is in constant touch with aircraft styling in both America and Europe. It will gladly co-operate with you in planning up-to-the-minute harmonies for your ships.

Complete information on any du Pont product for airplane use will be furnished either by mail or by a qualified representative.

AIR-TESTED FINISHES

Du Pont Dopes—The du Pont line of aircraft finishing materials includes clear, semi-pigmented and pigmented dopes. They are all tested formulas of remarkable durability—proven in service as well as in the laboratory. Flexible and highly blush resistant, the Army and the Navy have approved these products for their requirements. Available in a wide variety of highly visible colors.

Du Pont Paints and Varnishes—Du Pont chemists have developed a complete line of paints and varnishes including Dopeproof Paint, Spar Varnishes, Fuselage Varnish and Aircraft Enamels.

DU PONT
REG U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & CO., Inc

Industrial Finishes Division, Parlin, N. J.

2100 Elston Ave., Chicago, Ill. 351 California St., San Francisco, Cal.

Flint Paint and Varnish Limited, Toronto, Ontario, Canada

Du Pont Pyralin and Fabrikoid supply the comforts and refinements that brand your ships "luxurious."

CABIN-COMFORT! Cockpit-convenience!—These two factors play an increasingly important part in the successful marketing of planes.

And, for this reason, progressive manufacturers spare no effort to develop added refinements for their ships.

Enormous assistance to the aircraft stylist is offered by du Pont Pyralin and Fabrikoid. Extremely light, ideally durable, and beautiful in the most modern sense of the word, these materials are uniquely fitted for air service.

Pyralin in various colors and effects provides transparent windows, instrument boards and wing lights of smart appearance and utmost serviceability. Its unusual characteristics offer amazing opportunities for other original applications. Complete information on Pyralin and its many present uses will be furnished on request.

Fabrikoid brings aeroplane upholstery up-to-date. Its lightness and toughness unmistakably distinguish it as a material destined for air service. And the designs of the new Nemoutsa Aeroplane Fabrics express vividly the buoyancy and gaiety of this most modern mode of travel.

Du Pont technical men are ready to co-operate wholeheartedly in original styling with these materials. Please write direct to the division concerned.

AIR-TESTED MATERIALS

Du Pont Fabrikoid—Sturdy Fabrikoid is an ideal material for open cockpit upholstery. Will withstand varying weather conditions. Nemoutsa Aeroplane Fabrics are new type, light-weight materials developed for interior trims of cabin ships. Made on a high grade woven cotton base and treated with appropriate pyroxylin colors. Embossed in distinctive patterns.

Du Pont Pyralin—A strong, durable, light, unbreakable, transparent material furnished in any gauge from 5-1000 upward in sheets approximately 20 in. x 50 in. Ideal for windshields, cabin windows, running lights and other uses.

DU PONT
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E. I. DU PONT DE NEMOURS & CO., Inc.

DU PONT VISCOLOID CO., Inc.

330 Fifth Avenue, New York City

FABRIKOID DIVISION Newburgh, New York

Safety

Connecting rods are subject to great stress. Failure of these parts is safeguarded by securing each articulated rod to the master. Knuckle pins are slotted where they project beyond the master rod flange. Locking plates fit these slots and are secured to the master rod with screws which are held from turning by washers turned up against the flat of the head and down beside each plate.

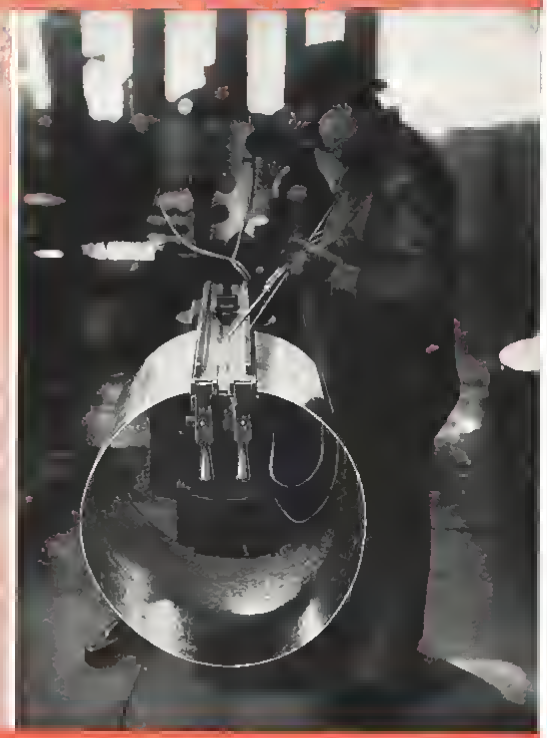
THERE is no quivering of the fabric or quaking of the fuselage when the Continental Red Seal Airplane Engine takes the air. Vibration has been reduced and the plane itself is as steady as the hum of the engine that carries it along. For Continental has considered smoothness and strength of paramount importance in building this engine. Smoothness that shows in every flight and strength that prolongs this smoothness for years. The Continental Red Seal Airplane Engine combines light weight and perfect balance with rugged dependability and then adds to these qualities a lack of vibration that surprises pilots and passengers alike.

CONTINENTAL AIRCRAFT ENGINE CO.
Office and Factory: Detroit, Michigan

Continental Engines

DO IT BY OXWELDING

As pioneers in every phase of oxy-acetylene welding and cutting, the thoroughly experienced engineering and service organizations of these companies can help you in the proper application of oxwelding to your present work and to new production activities.



Fulfilling every need for Oxwelding and Cutting.....

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The Linde Air Products Company

Prest-O-Lite
Dissolved Acetylene
The Prest-O-Lite Company, Inc.

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Apparatus and Supplies
Oxweld Acetylene Company

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General offices
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New York, N. Y.

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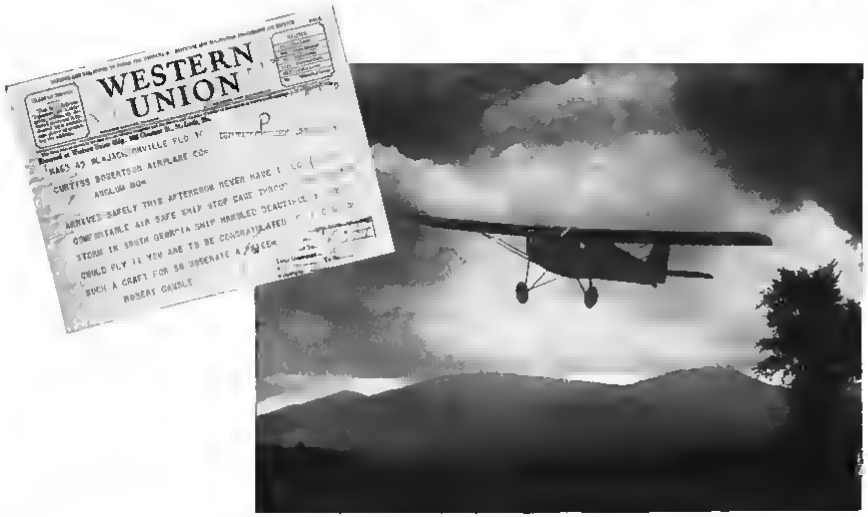
Principal cities
throughout the country

64 Linde plants—45 Prest-O-Lite plants—154 Oxygen Warehouse stocks 138 Acetylene Warehouse stocks—38 Apparatus Warehouse stocks—235 Carbide Warehouse stocks

Again ROBIN proves All-weather, All-purpose Plane



Endurance Holder's Sister Ships making notable Service Records everywhere

A HURRIED business man on a quick flight south Over Georgia—a sudden, fierce, semi-tropical storm. Slashing sheets of rain . . . tree tops nearly touching the ground . . . all living things scurrying for the nearest cover.

Next day comes a wire—the wire shown above—"Ship Handled Beautifully Anyone Could Fly It You Are To Be Congratulated . . ."

Congratulations!

To Curtiss these reports of the Robin from the flying fields of the world mean much. Steady, sure service for every flying purpose . . . dependable, consistent performance in fair or foul weather.

They prove just what their famous sister ship, the St. Louis endurance plane, proved. That the Robin can be depended on under all flying conditions.

Discover for yourself what the St. Louis Robin endurance flight proved. What owners of the Robin are proving every day. That Robin is the best all-purpose, all-weather plane in its price range.

Robin Proves Splendid Training Plane

The quiet of the cabin allowing natural conversation. The confidence-breeding stability . . . the high range of visibility—the lack of vibration . . . make the Robin the best cabin training plane of today.

And remember. Behind all Curtiss products stands the nation wide Curtiss Service. Forty Curtiss Branches . . . strategically located to give complete, prompt service to all Curtiss owners.

Write to us at once and let us send you full information about the Robin—and about the nearest branch to you. Department 16. Curtiss Flying Service, 27 West 57th Street, New York City.

Sales agents for Curtiss Robertson Airplane Mfg. Co., Cessna Aircraft Co., Curtiss Aeroplane and Motor Co., Incorporated, Ireland Aircraft, Incorporated, Command-Aire, Inc., Moth Aircraft Corporation

CURTISS FLYING SERVICE

"World's Oldest Flying Organization"

Would You, Too, be a Transport Pilot?

Would you like to join the bronzed young men who are flying the airplanes of America—and of the world? Would you like to share in the amazingly high salaries they are earning—assure yourself of an income which doctors, lawyers and professional men attain only after many long and hard years of study and work? Would you like to follow a profession that is as enjoyable as a game—that will keep you young, clear-eyed and athletic?

Then Come to Parks College

Take your training at the school that *without a minute's preparation* PASSED the Department of Commerce examination for approval as a Transport Ground and Flying School. Learn to fly at the largest aviation school in America—the school that has led the aviation industry in its drive for thorough and reliable training of pilots—the school that is internationally recognized as the outstanding aviation educational institution of the world.

Take your flight training at the hands of instructors who have seen hundreds of other young men go to success under their guidance. Parks flying instructors are highly specialized students of their profession. They know the best way to handle each new flyer—know how to carry each most swiftly and competently through the training that leads to Federal licenses and jobs at big pay. Similarly, Parks airplanes and shop equipment are the finest in the land—your guarantee of the finest training to be found anywhere in the world.

A Transport Ground Course for Every Student

Unlike other schools, Parks Air College is not content with the minimum of ground school instruction. Every graduate of Parks Air College Flying School, whether he be a Limited Commercial Pilot or an aspirant for a Transport Certificate, *is qualified to pass the United States Department of Commerce written examination* for a Transport License. That is in line with the unyielding determination of Parks Air College to qualify all its students, regardless of the length of their course, for ultimate participation in commercial aviation.

Remember, however, that it is the man who gets into aviation NOW, while the business is young, that will cash in most heavily on the returns that aviation offers. Get into the game, then, today. Fill out the coupon and let us send you the story of Parks and *what it means to you*.

PARKS AIR COLLEGE
AFFILIATED WITH PARKS AIRLINES, INC.

Largest Civilian Air School in America!
BOX 204-U, EAST ST. LOUIS, ILL.
Member Aeronautical Chamber of Commerce of U. S. A.

Parks Air College has been rated by the Aeronautics Branch, Department of Commerce, as an Approved Transport Ground and Flying School

MAIL THIS TODAY!

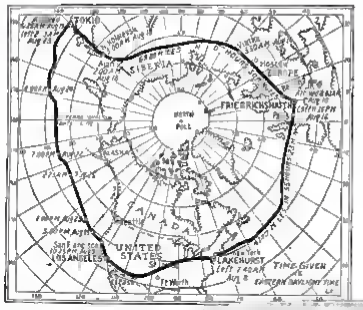
PARKS AIR COLLEGE,
Department 204-U,
East St. Louis, Ill.

Send me your illustrated catalog. I am interested in Aviation.

Name

Address

City State



Courtesy of the New York Times

"GRAF ZEPPELIN" GOES AROUND THE WORLD...

powered by Maybach Engines with Nickel Alloy Steel Parts...

Right: Maybach 12-cylinder 600 H. P. airship engine, same type as engine used in "Graf Zeppelin" m/f. by MAYBACH MOTOR CO., Friedrichshafen, Germany.

Below: Nickel Alloy Steel crankshafts of Maybach VL2 airship engine

NICKEL ALLOY STEEL PARTS IN MAYBACH ENGINES:

CRANKSHAFT
CONNECTING RODS
CAMSHAFTS
VALVE TAPPETS
And other Parts

Dependable materials are the best assurance of dependable performance

THE around-the-world flight of the famous "Graf Zeppelin" marks a new chapter in the history of aeronautics. Meeting successfully practically every kind of flying conditions, running continuously hour after hour at record breaking speeds—the long journey of the huge dirigible demonstrated again the wonderful endurance of Maybach engines and their dependable Nickel Alloy Steel parts.

Designers of the Maybach engines used in the "Graf Zeppelin" have taken advantage of the dependable uniformity of the mechanical properties of Nickel Alloy Steels—of the fact that the average, maximum and minimum values of Nickel Alloy Steels vary less from heat to heat than those of other commercial steels.

With this dependable uniformity established beyond question, practically all manufacturers of aircraft engines, both in America and Europe, have adopted Nickel Alloy Steels for highly stressed parts which must have utmost dependability without excessive weight.

Information on the properties and applications of Nickel Alloy Steels will be gladly furnished by our staff of engineers. You are invited to write for additional data

Nickel
FOR ALLOY STEEL

Send for "Buyers' Guide to Nickel Alloy Steel Products"

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

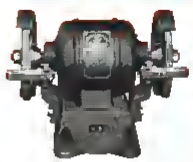
The Good Mechanic's Choice

U. S. ¼" Special Drill $24

The *real* mechanic *knows* good equipment. That's why you'll invariably find his shop equipped with electric tools and machines bearing the U. S. label. He knows that U. S. Drills, Grinders, Buffers, etc., handle jobs easier and better—also stay longest on the active list, especially in heavy, continuous service.

Drills

The U. S. line comprises the broadest range of its kind, including: Portable electric drills from ¼" to 1½" capacity, light and heavy duty. Drill stands. Drill accessories — saws, abrasive wheels, buffing wheels, rasps, valve seat pilots, etc. Tappers. Screw drivers. Hand blowers. Reamer drives. Sanders. Socket wrenches, etc.



U. S. 6" Bench Grinder $34.50

Grinders

U. S. Grinders supply every grinding need in the service shop: Portable grinders. Bench grinders. Valve grinders. Valve seat grinding sets, etc. Like all U. S. Products, each one embodies only those features that make for easy running and long life.

U. S. Combination Grinder and Buffer $99

Buffers

U. S. bench and pedestal buffers, combination buffers and grinders, etc., embody these high quality materials as built into all U. S. products: SKF Ball Bearings. Powerful motors. Chrome manganese alloy steel spindles, etc. Get all the reasons why U. S. Tools have been *the good mechanic's choice* ever since U. S. brought out the world's first portable electric drill and electric grinder over thirty years ago. Ask your jobber or write us.

THE STANDARD OF QUALITY SINCE 1897

THE UNITED STATES ELECTRICAL TOOL COMPANY

Oldest Builders of Electric Drills and Grinders in the World

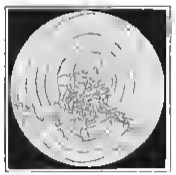
2466 West Sixth Street CINCINNATI, OHIO, U. S. A.

Atlanta, Boston, Chicago, Cleveland, Dallas, Denver, Detroit, London, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco, Syracuse

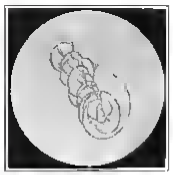
Export Sales Representatives—WESTINGHOUSE ELECTRIC INTERNATIONAL CO.—150 Broadway, New York City

Canadian Division—MAPLE LEAF ELECTRIC TOOLS, Ltd.—Toronto

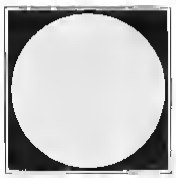
At right: Test rack of Curtiss-Robertson at Anglum Mo.



Above: What one blow from a man's fist did to one fabric finish exposed on test rack



Above: What weather alone did to another fabric finish exposed on test rack



Above: Cook's panel as it took oil after six weeks' exposure on test rack. Hardest blows failed to crack this finish.

You can stake your life on it!

Five Will Crack
One Won't!

The photograph at the top of this advertisement is not a beautiful thing to look upon. But to the aviation man who wants a fabric finish that won't crack, it tells a marvelous story.

The rack shown in this photograph is a test rack for fabric finishes. The panels on this rack carry dope and fabric finishes of six well-known makers of aviation paint. For many, many weeks, the pitiless sun has beaten down on them. Rain has poured over them. Ripping, tearing wind has whirled under, over and around them.

And then, men who must know the toughest, most durable fabric finish for an airplane have walked up and hit each panel on the rack. They have hit each panel hard.

Some panels cracked with the first blow. Some cracked after two or three blows. Only a few panels failed to crack, regardless of the number of blows.

During all of these tests, not a single Cook Paint & Varnish Co. panel cracked.

Tests like these explain why many prominent airplane manufacturers and fleet operators specify Cook's Fabric Finish for their planes. A similar test will put Cook's Paints on the plane of any man who wants the toughest, most durable fabric finish that money can buy. And the reason is obvious.

Airplane fabric prepared with Cook's Dope and Cook's Armorcote Fabric Finish will not crack. It will not crack even though you bend it double. It will not crack regardless of exposure to the wind and sun—to heat and cold—to rain, sleet or snow.

We have an interesting story for any aviation man interested in the most durable fabric finish for airplanes. It is fully explained in the Cook Finishing Plan, which we will be glad to send you on request. Write for it today.

COOK PAINT & VARNISH COMPANY

Aviation Division: 2426 North Broadway, St. Louis, Mo.

FACTORIES AT ST. LOUIS, KANSAS CITY, FORT WORTH, HOUSTON, CINCINNATI

August 23, 1929

American Cirrus Engines, Inc.
Belleville, New Jersey.

Gentlemen:

Congratulations!

If I had the ability to fly the Great Lakes Trainer as efficiently as the American Cirrus Motor performed, I am sure I would have won the Miami-Cleveland Race.

You may be interested to know that the American Cirrus was turning 2125 R. P. M. wide open the entire way and I want to congratulate you on its reliability.

Yours very truly

Bert Hassell

Bert Hassell.

1483 *miles at* Full Throttle. *Two stock Great Lakes Trainers, one of which carried mechanic and seventy-five pounds of spare parts and baggage, a total load of 600 pounds including pilot, flew in the Miami-to-Cleveland Derby, and finished second and fourth respectively.*

CIRRUS

AMERICAN CIRRUS ENGINES, INC.

WASHINGTON AVENUE, BELLEVILLE, N. J.

Great Lakes Scores Again!

DURING the National Air Races at Cleveland, Great Lakes proved again—*and most conclusively*—that a sturdy, rugged, lightweight ship, designed and built for training may also possess the speed and extreme maneuverability of a sport pursuit job

Here are the results, in races open to planes powered with motors of 510 cubic inches. And remember—Great Lakes' American Cirrus Motor has a displacement of only 310 cubic inches.

Miami to Cleveland Derby—Streamlined Great Lakes Sport Trainer with Charlie Meyers at the controls, finished second. Great Lakes Sport Trainer, strictly stock model, flown by Bert Hassell with baggage, tools and a mechanic finished fifth.

Women's Sixty Mile Closed Course Race—Strictly stock Great Lakes Sport Trainers, piloted by Lady Mary Heath and Blanche Wilcox Noyes, finished second and third.

Men's Sixty Mile Closed Course Race—Streamlined Great Lakes Sport Trainer, flown by Charlie Meyers, took fourth place against a large field.

A thorough knowledge of aviation engineering, with a consequent perfection of design, plus practical experience in standardized production of aircraft in a large, well organized and modern plant, has made the Great Lakes Sport Trainer dominant among light planes.

Just the kind of ship you have always hoped someone would build—ideal for training, for business or for sport flying. A new booklet describes it in detail. Send for it.

GREAT LAKES AIRCRAFT
CORPORATION CLEVELAND

Manufactured under U. S. Department of Commerce Approved Type Certificate Number 228

Aviation's *most valued feature* SPEED!

SPEED!

--with safety Aviation's greatest attribute. For speed saves time--and "time's the stuff life's made of!"

Realizing these facts, The M. A. Long Company has geared its organization to beat all building records. Where great speed has become essential, greater speed has been the answer.

On March 8, 1929, the Berliner-Joyce Aircraft Corporation awarded the contract for the construction of its airplane manufacturing plant to The M. A. Long Company. On May 17, 1929, Berliner-Joyce moved in! The M. A. Long Company eclipsed its promise by five full days! . . . and this in spite of nine days rain . . . a real record-breaking feat.

Speed with safety is essential--both in aviation and aviation construction. The fastest moving industry in the world needs quick cooperation.

If you are contemplating the construction of an airplane factory, an airport, or any building of kindred nature, communicate with us by air mail. Our answer will be quick; our work efficient.

The M. A. LONG *Co.*

Engineers and Constructors

10 WEST CHASE STREET BALTIMORE, MARYLAND

Since the completion of the Berliner-Joyce Factory, contract for the construction of the largest privately owned Wind Tunnel in the world has been awarded to The M. A. Long Company.

Actual aerial photograph of the Berliner Joyce Airplane Factory

ALLENTOWN · CHICAGO · WASHINGTON

AVIATION

The Oldest American Aeronautical Magazine

EDWARD P. WARNER, *Editor* — JAMES H. McGRAW, JR., *Publishing Director*

R. SIDNEY BOWEN, JR., *Associate Editor*

LESLIE E. NEVILLE, *Technical Editor* — CHARLES H. GALE, *Assistant Editor*

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CHARLES F. McREYNOLDS, *Pacific Coast Editor* — JOHN T. NEVILL, *Detroit Editor*

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AVIATION

THE OLDEST AMERICAN AERONAUTICAL MAGAZINE

A McGRAW-HILL PUBLICATION ESTABLISHED 1916

EDWARD P. WARNER, *Editor*

VOLUME 27 . . . *October 12, 1929* . . . NUMBER 15

A Sad Occasion

SECRETARY MacCRACKEN'S determination to leave the government service having remained firm in the face of all persuasion, he has finally transferred to other hands the work of the office that he built up from nothing. It would be absurd to sound any note of farewell, for whatever the new activity upon which he decides to embark, William P. MacCracken, Jr. will remain a leader in American aeronautics. His words will always command attention on their own account, without the necessity of depending upon any governmental position as a sounding board to magnify their volume.

The work in the Department of Commerce is but a passing phase of his career, but in the history of American aeronautics it has been epochal.

The regulation of aeronautics has presented a tricky problem in every country, but in most cases the regulatory authorities have had a chance to grow up with the job. None of them have ever had such a task as confronted Secretary MacCracken three years ago. The law threw upon him the obligation of licensing aircraft and pilots forthwith, and before the organization that he assembled had had time to get acquainted with its surroundings it was inundated with demands for immediate action upon thousands of planes and pilots that had so far been operating in blissful freedom from any sort of control. No man ever had a chance to make himself more thoroughly unpopular than the Assistant Secretary of Commerce for Aviation. Not only has the first incumbent of that office escaped the opprobrium that pessimists foresaw for him, but he leaves Washington the possessor of the virtually unanimous admiration and affection of the aeronautical community. His courage, his judgment, his tact and his success as a chairman and conciliator, and his learning in the law have commanded equal admiration.

Secretary MacCracken has enjoyed a great privilege, commensurate with his great responsibility. The first holder of an office has the opportunity, if he lays his foundations well, of shaping the course of all of his successors. The Federal control of American aviation will continue along the lines laid down under MacCracken's guidance. General decisions were taken once and for all in the summer of 1926. Only one man could be Assistant Secretary of Commerce for Aviation starting from scratch, with a clean sheet upon which to write the record.

IN THIS VALEDICTORY Secretary MacCracken's work, there has been a loyal effort to preserve a properly editorial impersonality of tone. The endeavor is in vain. Personal feeling is too strong. The writer of this editorial was Bill MacCracken's colleague for two and a half years. To know him intimately and to see how he worked was to understand why and how he has achieved signal success where there were so many paths that would have led to failure. To be acquainted with him in any degree has been to understand why he commands universal confidence and how he has made himself one of the outstanding figures of Washington. He will be missed from the life there, as the aircraft industry will miss him from the work that he has been doing, and as his associates in the Department of Commerce, great as is their affection for the new chief of the Department's aeronautical activities, will mourn his departure from the office at Nineteenth Street and Pennsylvania Avenue.

The Younger Generation and the Model Plane

INSTRUCTION in flying is beyond the reach of the average high school boy, but he need not despair of gaining practical experience in aviation. He can go where such pioneers as Penaud and Langley did—where high-school enthusiasts have been going for twenty years—to the model airplane. He can be his own designer, operate his own research laboratory, his own factory, and finally play the part of the pilot. Paving the way for his own subsequent aeronautical activities on a broader scale, at the same time he will be giving his family and the neighbors a chance of learning the principles of flight by absorption.

The activities of the model fliers cannot be overlooked by the aircraft industry. They play too large a part in attracting young men's attention to the aeronautical profession as a life vocation, in giving school children who will be the potential airplane owners and air line patrons of ten years hence a knowledge of how aviation works and dispelling its mystery, and in spreading immediate air-mindedness among their elders.

The model-builders have pushed their records up to new levels even more rapidly than have the operators of man-carrying craft. Duration records for models have been more than doubled in the last two years, and multiplied by six in the last decade. They are increased exactly as are those for the full-sized machines—by research, by ingenuity applied to design, and by unfailingly beautiful workmanship. Some of these youthful record-breakers would be surprised to be told that they are engaged in research, but it is none the less true. Improving their designs by deduction and measured trial, they are operating in the true spirit of the laboratory.

There are some thousands of young people in the United States who are designing and building highly successful flying models, most of them making of it their principal avocation. Their activities are due almost entirely to the support of a few local enthusiasts, such as Merrill Hamburg in Detroit and Paul Garber in Washington to the coordinated national work of the Playground and Recreation Association under the lead of T. E. Rivers and to the interest shown by the American Boy Magazine. A few cities scattered over the country stand out in model flying as Wichita has in airplane manufacture, because in them the boys have found leaders. There could be twenty times as much interest, with proportionately more young people engaged, if only airplane manufacturers, N.A.A. chapters, and groups of enthusiasts generally would everywhere take hold and give their backing, spurring on and helping out the local playground recreation director. At least there ought to be model flying, and lots of it, in every city where there is an airplane plant.

The Playground Association's annual national flying meet will be held in Louisville next week. The leaders of the industry, with a few happy and conspicuous exceptions, have so far been singularly indifferent to the Association's work and to all model flying. They have been neglecting a good prospect. They ought in their own interest to take it up, give prizes, contribute to organization funds, and give as much of their personal time as possible. Without their participation the Playground Association is likely to grow discouraged, and model flying except in two or three exceptional cities to fade into desuetude. The industry dependent upon a constant development of new markets for its products and services, cannot afford to allow that.

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The Lexicographers Take a Hand

THE NEWSPAPERS bring many curious evidences of the hold which aviation has taken and maintains upon the public interest. One of the most striking is the enthusiasm shown by the dictionary makers for keeping abreast of the subject and even gratuitously contributing to it. It is a general rule that a new art or science has to create its own specialized vocabulary, which creeps along an arduous path into the standard dictionaries after it has gained acceptance and some degree of standardization by the specialists. For aeronautics the order of events is threatened with reversal, as specialists upon the formation of language are offering us suggestions for strange and custom-made terms which they are prepared to welcome into their own manuals of English pure and undefiled. It is but a few days since one of the greatest authorities upon the contents of dictionaries and their construction intimated that the words "enplane" and "deplane" would henceforth be recognized as in good standing.

It seems unkind to repudiate expert assistance of any sort, yet we are convinced that the more normal method of adopting technical terms into the language only after they have been approved by the technical specialists as meeting a definite need of their own is the sounder one.

We are opposed to freighting the language with any more aeronautical terms until a substantial number of people actively engaged in aeronautical work show some interest in acquiring additions to the vocabulary. And on nine occasions out of ten when a new word is needed, it will not be artificially constructed, but will take a spontaneous origin in the field as did such terms as "dolly" or "stagger wire."

We cannot speak for the degree of the lexicographer's knowledge upon the subject, but even within the aeronautical industry there seems to be a remarkable ignorance of the present existence of a standard aeronautical dictionary. The National Advisory Committee for Aeronautics has called a series of nomenclature conferences, at which all of the interested government departments, the aeronautical industry, and the publishers of aeronautical magazines have been represented, to determine what technical expressions should be recognized and how they should be defined. The last such meeting was some three years ago. The members labored long and faithfully and brought forth a weighty report. It is time for reconsideration, for possible revision and for certain supplement, and we urge upon the National Advisory Committee the planning of another such conference. If it is called, the basis of representation should be broader than before, for aeronautical activities have broadened incalculably, and among others whose active participation should be sought, both for their own good and for ours, are the experts in philology and other verbal lore. Their help is needed, but it should not be left for them to lead the way. Despite the extent of our other obligations, we who are interested in aeronautics and in clarity and accuracy of expression of aeronautical thought should find time, in co-operation with the government departments and under the leadership of the National Advisory Committee, to keep our own vocabulary up-to-date and write our own dictionary.

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Give the Plane a Name

THE TIME is near at hand when each model of aeroplane should have a distinctive name or mark of identification.

The Army and Navy service planes have generally been designated by a symbol. There were comparatively few models in the service designed for different lines of duty, and they were readily recognized by those familiar with them. Now along comes an enthusiastic public interested in the development of aviation. The industry has grown from a few manufacturers of planes to well over a hundred in this country alone. Even the trained eye of the old timer in aviation falters when he tries to pick out a plane by some feature of design. The time has passed when the familiar war models held sway.

The manufacturers of automobiles are now almost universally giving each design a separate trade name, though the same manufacturer may be the builder of several models under as many different titles. A distinctive name, not merely one descriptive of some feature of design placed conspicuously on the plane would be a great help to the befuddled memory of the average enthusiast who has to be reckoned a potential purchaser.

The aviation industry is a comparatively new study to a large majority of its enthusiasts today. Every possible effort should be employed to simplify their education and increase their interest in aeronautics. Getting away from cryptogrammic, or uninspired and monotonous, nomenclature will be a help.

A Rift in the Fog

THE NEWSPAPERS have done their best to appraise the significance of Lieutenant Doolittle's recent blind flight under the auspices of the Guggenheim Foundation. Where they have failed to gain the true perspective it has been for want of technical knowledge and not from any lack of enthusiasm, for the demonstration had an enormous popular appeal. The danger of the moment is, in fact, that the practical significance of Lieutenant Doolittle's feat will be overestimated, with the usual unfortunate popular reaction when it becomes apparent that all difficulties have not been swept away in a stroke, and that there is work still to be done. Mr. Guggenheim has been meticulously careful, as all others actively participating in the work undoubtedly would be, to avoid any suggestion that fog has been definitely overcome as an obstacle to air transport. No matter how much caution may be observed, however, or how modest may be the claims of those who have done the work, the flight made at Mitchel Field last week remains a star of the first magnitude above the aeronautical horizon. No degree of conservatism can disguise its importance, greater than that of a score of broken records or other more spectacular episodes. It is easy to think of new difficulties in the way of wholesale application of the methods that Lieutenant Doolittle used, but that is unimportant for the moment. The important thing is that we are moving in the right direction.

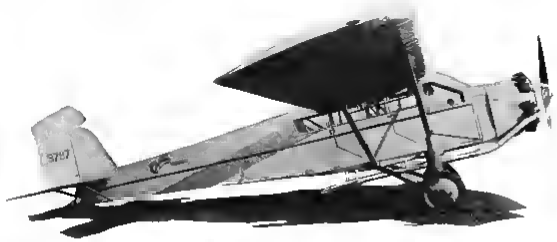
For the first time it has been proven that a superlative pilot, operating to a large field with not too many obstacles to dodge in the approach, working under fairly good conditions, and with a machine having a moderate landing speed, can become completely independent of visual guidance. It remains to whittle away those limitations one by one, and particularly to make further improvements in instrumental equipment, so that blind flying may go on for hours without undue strain upon the faculties of the pilot in endeavoring to follow several flickering pointers simultaneously.

It is a striking fact that the progress so far made has been from development rather than from invention. There was nothing new in principle about the instruments that Lieutenant Doolittle used, but they were superior in accuracy to, and easier of interpretation than, any that were to be had when the Guggenheim Fund started its work. There will be further advances along the same lines, but it is fair to hope that there will be invention too, and in particular that barometric altimeters will be supplemented by others independent of air pressure. The work of making blind flying commercially practicable will go forward with a renewed vim, both in the field and in the laboratories where the fundamental studies have been patiently and silently carried forward. If the Guggenheim Fund had never had anything else than this to its credit, all of the work it has done and the money it has expended would still be justified.

THE FIFTH ANNUAL National Air Tour TAKES OFF

By JOHN T. NEVILL

HAVING AMASSED a total score of 5,709 08, Johnny Livingston, president, Midwest Airways of Aurora, Ill., flying a Waco 225, led 28 additional entrants in the Fifth Annual National Air Tour for the Edsel B. Ford Trophy, when the famous commercial airplane reliability entourage hove out of a hazy horizon and landed on St. Hubert's Airdrome, Montreal, Canada, Sunday afternoon, Oct. 6, principally because of his exceedingly low stick and unstick score, the lowest of any entrant in the Tour. Livingston's entry No. 26 held a lead in Montreal of approximately 550 points in excess of his closest competitor. The landing at St. Hubert's marked the finish of the fourth of 32 legs comprising the 1929 event, a course that will carry the 29 contestants and more than eleven accompanying craft, a total of 5,017 miles through twenty states and two Canadian provinces. At Montreal 562 miles of this distance had been covered and the planes were preparing Monday morning to re-enter the States for their first landing in the States at Portland, Me.



Left: Side view of the new Challenger powered Curtiss Thrush," two of which are competing in the Tour. Below: A Cirrus powered Moth biplane also competing

With a score of 5,165.72 points, Arthur J. Davis, of Lansing, Michigan, also piloting a Waco 225, was in second place, approximately 180 points ahead of third man M. E. Zeller, at the controls of Ford monoplane powered by a Pratt & Whitney Wasp and two Wright J-6 300s. Zeller's score was 4,982.96. Davis and Zeller are flying entries No. 8 and 16 respectively, the remainder of the field, according to entry number and score were as follows:

41, Fairchild KR, entry, 4,902 80, 29, Curtiss Condor entry, 4,707 64; No. 33, Cessna entry, 4,271; No. 5, Bellanca entry, 4,179, No. 6, Bellanca entry, 4,090.56, 31, Spartan entry, 4,004 68; No. 20, Fairchild KR entry, 3,697.16, No. 10, Wallace entry, 3,581 38; No. 34, Cessna entry, 3,570 80, No. 35, Cessna entry, 3,493 36; No. 23, Curtiss-Robertson entry, 3,462 40, No. 17, Ford entry, 3,355 45, No. 28, Curtiss-Robertson entry, 2,952 64; No. 1, Great Lakes entry, 2,906 36; No. 40, Fairchild 71 entry, 2,900 32; No. 3, Moth entry, 2,851 92, No. 21, Ryan entry, 2,765 24, No. 32, Lockheed entry, 2,663 72; No. 25, Curtiss-Robertson entry, 2,573 16, No. 9, Command-Aire entry, 2,559.72, No. 14, Boeing entry, 2,438 44; No. 18, American Eagle entry, 2,393 4; No. 24, Curtiss-Robertson entry, 2,388 36, No. 19, Moth entry, 2,302 76; No. 4, Travel Air entry, 2,114 30; No. 2, Great Lakes entry, 2,038 96.

During the first four legs of the long route, only three contestants have failed to make the required average speed between control points qualifying them for their respective "perfect score" for the leg. Ford entry No. 17, which, according to the formula, must maintain an average speed of 106.36 m.p.h. over every leg, failed to do that on the initial jump, a short fifteen mile hop between Ford airport and Windsor, Canada. This leg was scarcely long enough to give the pilots time to gain a safe altitude and open up their throttle and it was surprising that only one of the 29 starters suffered a reduced leg score with exception of No. 17, which is piloted by B. S. Warner.

The other two imperfect scores were made by Major Carol Cone, pilot of Command-Aire No. 9, and Travel Air No. 4 flown by Newman Wadlow, the youngest pilot in this year's Tour. Major Cone suffered an impromptu landing on the 207 mi. stretch between Windsor and Toronto, and Wadlow was several minutes getting into Montreal because of a drop in his oil pressure. For failure to maintain the required speed, No. 17 lost 202.75 points, No. 9 lost 199.85 points, and No. 4 lost 98.42 points. In order to avert any handicap against any of the contestants caused by a field made muddy by rain, after some of the contestants had gone through their stick and unstick tests, Manager Collins this year decided to hold the tests on concrete runways. The pre-Tour tests were run off in good order despite considerable thick weather that kept a number of the pilots on the ground en route to Detroit until the day following the departure on Saturday, October 5. The weather cleared, however, on Saturday morning and remained fairly nice.

The official entry list is as follows:

1. Great Lakes Trainer, 2T1, Charles W. Meyers, American Cirrus Mark III, Great Lakes Aircraft Corp.
2. Great Lakes Trainer, 2T1, Capt. Wm. Lancaster, American Cirrus Mark III, Great Lakes Aircraft Corp.
3. Gypsy Moth, Al Krapish, DH Gypsy, Moth Aircraft Corp.
4. Travel Air, 6000 B, Owen G. Harned, Wright J-6 300, The Travel Air Co.
5. Bellanca, CH 300, Capt. G. W. Haldeman, Wright J-6 300, Bellanca Aircraft Corp.
6. Bellanca, CH 300, R. A. Nagle, Wright J-6, 300, Bellanca Aircraft Corp.
7. Bellanca, CH 300, Steward Chadwick, Wright J-6, 300, Bellanca Aircraft Corp. (out).
8. Waco, 225, Arthur J. Davis, Wright J-6, 225, Waco Aircraft Co.
9. Command-Aire, 5-C-3, Major J. C. Cone, Curtiss Challenger, Command-Aire, Inc.
10. Wallace Tourplane, Don Mather, Kinner K-5, American Eagle Aircraft Co.
11. Pitcairn autogiro (out).
12. Pitcairn autogiro (out).
13. Lockheed, Vega (out).
14. Boeing, 95, Reuben Wagner, Hornet, Boeing Airplane Co.
15. Acme (out).
16. Ford, 7-AT, M. E. Zeller, 1 Wasp and 2 J-6 300 Stout Metal Plane Co.

A Wright J6 powered Waco in flight

17. Ford, 5-AT, B. S. Warner, 3 Wasps, Stout Metal Plane Co.
18. American Eagle A-1-29, Mae Haizlip, Kinner K-5, American Eagle Aircraft Co.
19. Gypsy Moth 60 GM, Frances Harrell, DH Gypsy, Moth Aircraft Corp.
20. Fairchild, KR-34, Keith Miller, Wright, 165, Fairchild Airplane Mfg. Co.
21. Ryan B-5, Russell Young, Wright, 225, Ryan Aircraft Co.
22. Corman (out).
23. Curtiss Thrush, Dale Jackson, Wright, 225, Curtiss-Robertson Airplane Co.
24. Curtiss Robin, C-1, W. G. Shelton, Curtiss Challenger, Curtiss-Robertson Airplane Co.
25. Curtiss Robin, J-1, Forest O'Brine, Wright 165, Curtiss-Robertson Airplane Co.
26. Waco, 225, John Livingston, Wright 225, Waco Aircraft Co.
27. Curtiss, Carrier Pigeon II (out).
28. Curtiss Thrush, J. L. McGrady, Wright, 225, Curtiss Aeroplane and Motor Co.
29. Curtiss Condor, {J. W. Crosswell and K. E. Voelter}, 2 Conquerers, Curtiss Aeroplane and Motor Co.
30. Pitcairn, autogiro (out).
31. Spartan, C-3, William Welborn, Wright 165, Spartan Aircraft Co.
32. Lockheed, Vega, Wiley Post, P. and W. Wasp, Lockheed Aircraft Co.
33. Cessna, AW, Earl Rowland, Warner Scarab, Cessna Aircraft Co.
34. Cessna, DC 6B, Stanley Stanton, Wright 225, Cessna Aircraft Co.
35. Cessna, DC 6A, Steve Lacey, Wright 165, Cessna Aircraft Co.
36. Alexander, Bullet (out).
37. Alexander, Bullet (out).
38. Alexander, Bullet (out).
39. Laird, LCB (out).

40 Fairchild, 71, R W Pears, P and W Wasp, Fairchild Airplane Mfg Co
41 Fairchild, KR 34, D Morgan Hackman, Wright, 300 Fairchild Airplane Mfg Co

THE TOUR'S THREE WOMEN PILOTS, Mrs Keith Miller, Miss Frances Harrell, and Miss May Haizlip, are pitted against a field of 28 male pilots among them being a considerable number of the most skilled aviators in the country Of the three women Mrs Miller is easily the most experienced having built up a noteworthy reputation in Australia and England before coming to the United States In the Tour she is piloting a 165-hp Wright engined Fairchild KR-34 biplane Miss Haizlip, whose participation in the recent women's derby to the National Air Races at Cleveland brought her to the forefront among women fliers, is flying an American Eagle biplane powered by a Kinner K-5 engine The remaining aviatrix, Miss Harrell, graduated from the Curtiss Flying School in New York City less than one year ago She flew a Gypsy Moth in one of the events for women contestants at Cleveland, and is piloting a similar charge in the Tour, as a member of the Curtiss team Realizing the publicity value of having a woman pilot on their team, several manufacturers, including Travel Air, made last-minute attempts to secure the services of such a pilot Mrs Louise M Thaden, winner of the women's derby to Cleveland, it is understood received two such offers, but too late to complete the necessary arrangements It is regrettable that Mrs Phoebe Fairgrave Omlie the only woman pilot in the Tour last year was not able to take part in this year's event She also made a last-minute effort to get in the line-up, but the entry list had closed

Among the male pilots we find only 3 or 4 that have contested in the Tour on previous occasions, these being the veterans Charles W Meyers, R W (Dick) Pears, Capt George W Haldeman and John Livingston Meyers, who has flown a Waco on all previous occasions now is chief test pilot for the Great Lakes Aircraft Corporation, and is flying one of their 2T1 trainer biplanes Dick Pears, it will be recalled piloted a J-6 powered Fairchild cabin monoplane in the 1928 Tour He is back this year with a Pratt and Whitney Wasp engined Fairchild 71 George Haldeman, chief test pilot and salesmanager for Bellanca, is in the Tour this year with a Wright R-975, 300-horsepowered Bellanca monoplane, generally known as a Bellanca CH-300 Last year Captain Haldeman flew a Bellanca CH, equipped with a 225-hp Wright

Two of the pilots who have contested in previous years are listed among the officials this year, these two being Captain Frank M Hawks, referee, and E W (Pop) Cleveland, official starter Captain Hawks piloted a tri-engined Ford monoplane in the 1928 Tour and a Ryan-B-1 in the 1927 classic. On the present Tour he will officiate as referee, using his Wasp powered Lockheed Air Express with which he set the current speed record for trans-continental flying Pop Cleveland last year participated in the Tour for his initial time, using a Ryan B-1 monoplane, engined with a Wright J-5-C As starter he is flying a new Travel Air monoplane purchased recently by his employers, the Cleveland Pneumatic Tool Company, of Cleveland, O

Aside from those already mentioned the Edsel Ford trophy is being flown for this year by a large number of skilled and veteran airmen, notable among whom are Reuben Wagner, veteran mail pilot of the Boeing system, Dale Jackson and Forest O'Brine, endurance record holders, Maj J Carol Cone commanding officer, 154th Observation squadron, Arkansas National Guard, and salesmanager, Command-Aire, Inc, "Al" P Krapish, chief test pilot, Moth Aircraft Corporation, D Morgan Hackman, winner of the Cleveland-Toronto race, William Welborn, chief test pilot, Spartan Aircraft Company, Earl Rowland, winner of the Class A Los Angeles derby and the Miami-Cleveland derby, Steve Lacey and Stanley Stanton

The entry list in the 1929 Tour had at one time contained more than 40 entrants but, due to one cause or another the list simmered down to a total of 30 Inability to secure Department of Commerce Approved Type Certificates in time for the Tour undoubtedly caused the greatest portion of this reduction Capt Ray Collins tour manager, and the Rules Committee, headed by Capt. L N Woolson, of the Packard Motor Car Company, adhered to this rule strictly this year, although it caused some trouble due to misunderstanding, at the airport at what might be called the last minute Planes definitely entered in the event, but ruled out because of the manufacturer's failure to get A T C's before October 1, included three Eaglerock Bullets, the new Corman tri-engined cabin monoplane, and the Aeme biplane The waiving of that rule, alone, would have swelled the entry list to 36 planes However, it seems to the writer, that the wisdom of sticking by each and every one of the rules is evident

Other craft entered but withdrawn later were three Pitcairn autogiros, a Curtiss Carrier Pigeon II, and a Laird LCB, J-6, 300 engined biplane. The Laird, which holds A T C. No. 86, is believed to be the only one of these five planes with an Approved Type Certificate It is known that the autogiros have none It is regretted that Mr. Laird, who had intended flying his entry, was compelled to withdraw. It would have been the first time the pioneer airman, who tought himself to fly in 1912, has completed in the National Air Tour

The number of airplanes actually competing in the Tour this year is augmented by a considerable additional number which are flying around the 5,917-mile route as either non-contesting unofficial planes or non-contesting official planes Among such craft that took off from Ford Airport are the following:

One Douglas 0-2, piloted by Lieut. Wendell Brookley, and carrying Capt. Ray Collins, Tour Manager.

One Lockheed Air Express, piloted by Capt Frank Hawks, Tour Referee

One Travel Air cabin monoplane, piloted by E W. (Pop) Cleveland, Tour Starter, and carrying R. R. Blythe, and Louis Firsht, assistant manager

One tri-engined Ford monoplane "Firestone" carrying newspapermen.

One Lockheed Vega monoplane, carrying representatives of the Detroit *News*

One tri-engined Ford, Standard Oil equipped with radio, and carrying C. G. Andrus, official weather bureau man

One tri-engined Ford, service plane of Wright Aeronautical Corporation

One Vought "Corsair," service plane of Pratt & Whitney Aircraft Company

One "Goodrich" Lockheed, piloted by Lee Schoenhair, carrying Arthur G Schlosser, official scorer.

One tri-engined Corman, piloted by J. C. Kelley and carrying "Doc" Kincade,

For the purpose of providing the Tour pilots with constant information as to meteorological conditions across their path, the United States Weather Bureau with the co-operation of the Standard Oil Company, of Indiana, and the Radio Corporation of America has supplied the Tour with a "flying weather bureau" The bureau, a tri-engined Ford monoplane owned by the Standard Oil Company, is equipped with the latest of radio facilities, and is in charge of C G Andrus government weather expert, of Cleveland who accompanied the 1928 National Air Tour in a similar capacity Plans for the "flying weather bureau" were announced by Norman B. Conger, of Detroit, senior meteorologist of the government service, shortly before the starting date. Mr Conger also is a member of the National Air Tour Committee

In weighing up the competing planes in the current Tour, Tour officials used official Department of Commerce figures on the respective planes' allowable gross weight, empty weight, and allowable useful load The weight then was built up by means of the pilot, passengers (if any) and accessories or sand (if necessary) to the allowable useful load The stick unstick and maximum speed tests then were carried out with this load aboard Prior to starting the Tour, however, each pilot was permitted under the rules to reduce his load by 25 per cent, being given credit for 100 per cent in the formula Similarly, each pilot on the Tour is required to maintain only 85 per cent of his maximum speed in flying the route, being given credit for the full 100 per cent exhibited in the pre-Tour tests Last year the rule as to reduction of weight was the same although the speed required was 80 per cent instead of 85 per cent

Results of the stick and unstick and speed tests on the competing planes, with their required contest load and their 'figure of merit," or score to be maintained over each leg of the route will be published later

FROM A STATISTICAL VIEWPOINT one of the most interesting revelations brought about by this year's Tour is the tendency toward higher powered engines It is noteworthy that of 35 engines powering the competing planes 22 are in that range from 200 to 600 hp, and 13 are under 200 hp More specifically, 4 are under 100 hp 9 range between 100 and 200 hp, 13 range between 200 and 300 hp, 6 range between 400 and 500 hp and 3 range between 500 and 600 hp A total of 33 of the 36 engines are air-cooled, the remaining two being the 600-hp geared Curtiss Conquerers installed on the Curtiss Condor The 18-passenger Condor, incidently, is the largest plane competing in the Tour, the smallest being the 60 hp DH Gypsy Moth, of which two are entered It also is interesting to note that 27 of the 30 planes are single engined, one is dual engined and two are tri-engined

Other statistical information follows:

No of Planes	30
No of Miles	5 017
No of Stops	32
No of Biplanes	13
No of Monoplanes	17
No of Open Biplanes	12
No of Closed Biplanes	1
No of Open Monoplanes	(none)
No of Closed Monoplanes	17
No of Single-Engined Planes	27
No of Dual-Engined Planes	1
No of Tri-Engined Planes	2
Engines under 100 hp	4
Engines, 100-200 hp	9
Engines between 200-300 hp	13
Engines between 300-400 hp	(none)
Engines between 400-500 hp	6
Engines between 500-600 hp	3
Largest Plane in Tour	Curtiss Condor
Smallest Plane in Tour	DH Gypsy Moth
Highest Powered Engine	600-hp Curtiss Conquerer
Lowest Powered Engine	60-hp Gypsy
Air-Cooled Engines	33
Water-Cooled Engines	2

With a total of 20 Wright engines among the 35 represented, the Wright Aeronautical Corporation leads the field in supplying individual power plant units to the 1929 Tour. The Wright company has ten 9-cyl, six 7-cyl and four 5-cyl in the Tour, Pratt and Whitney has 3 Wasps and one Hornet, Warner has one Scarab, and the following engines are represented by two of each: American Cirrus II, DH Gypsy, Curtiss Challenger, Curtiss Conquerer, and Kinner K-5

Be it understood that the foregoing statistical figures relate *only* to those planes competing for the Edsel Ford trophy

WEATHER CONDITIONS in and around Detroit very nearly caused postponement of the Tour's start, 12 of the competing planes being forced down at waypoints as late as the evening of Oct. 2 All of the contestants were to have been on Ford Airport not later than the morning of Oct 1

Captain Hawks, Referee has announced the following figures as the official leg mileage on the 1929 Tour:

Detroit–Windsor	15 miles
Windsor–Toronto	207 "
Toronto–Ottowa	228 "
Ottowa–Montreal	112 "
Montreal–Portland	206 "
Portland–Springfield	152 "
Springfield–New York	112 "
New York–Philadelphia	96 "
Philadelphia–Baltimore	90 "
Baltimore–Richmond	128 "
Richmond–Winston–Salem	183 "
Winston–Salem–Greenville	152 "
Greenville–Augusta	100 "
Augusta–Jacksonville	210 "
Jacksonville–Macon	200 "
Macon–Atlanta	72 "
Atlanta–Murfreesboro	191 "
Murfreesboro–Cincinnati	246 "
Cincinnati–Louisville	87 "
Louisville–St Louis	261 "
St Louis–Springfield	183 "
Springfield–Wichita	215 "
Wichita–St Joseph	192 "
St. Joseph–Des Moines	145 "
Des Moines–Cedar Rapids	99 "
Cedar Rapids–St Paul	219 "
St Paul–Wausau	171 "
Wausau–Milwaukee	160 "
Milwaukee–Moline	174 "
Moline–Chicago	149 "
Chicago–Kalamazoo	142 "
Kalamazoo–Detroit	120 "

THE USE OF *Light Alloys* IN THE MANUFACTURE OF AIRCRAFT

The American Electrochemical Society Discusses Their Status and Their Future Possibilities

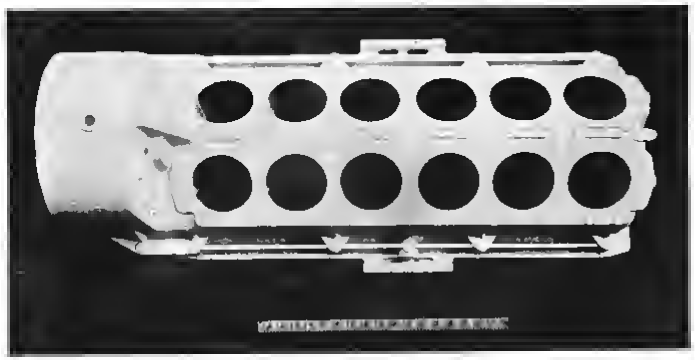
Junius D. Edwards assistant director of research Aluminum Company of America

AT THE GENERAL MEETING of the American Electrochemical Society held in Pittsburgh during the week of September 16th, aeronautics had a substantial place upon the program for the first time. One session was devoted especially to aeronautical problems and the aeronautical applications of the electrochemical industry's products, and especially to aluminum alloys and other light metallic materials.

Of the several papers presented bearing upon aeronautical problems, three treated of the possibilities of as many different metallic materials; aluminum, magnesium, and beryllium. The text on aluminum, presented by Mr. T. W. Bossert of the Aluminum Company of America, needs no extended review as it was a general summary for an electrochemical audience, of matters with which aeronautical specialists are already largely familiar. It went over ground very similar to that covered by some of the papers presented at the light alloy session of the Society of Automotive Engineers at Cleveland, and reported in AVIATION for September 7.

Discussion of Mr. Bossert's paper was participated in by Dr. George W. Lewis of the National Advisory Committee for Aeronautics and the present writer. Both speakers paid tribute to the electrochemical industry and to the present dependence of aeronautical engineering upon its products. The writer undertook to analyze the possibilities of the industry as an aluminum market.

THE AGGREGATE WEIGHT of those structural parts which might be made of aluminum alloys in the present years production of aircraft and aircraft engines was estimated to be of the order of 3,500 tons. If the aluminum industry were to get all that business, displacing steel and wood completely, the aircraft market would absorb about four per cent of the nation's total production of the metal. Actually, less than one per cent goes into aeronautical work, and of the total number of airplanes licensed in the United States only about two per cent are constructed entirely of aluminum alloy. Wooden wing spars and welded steel tube fuselages remain the accepted rule, and it was suggested in the discussion that the reason is primarily economic, and that the more extended use of light alloys depends upon the development of cheaper methods of fabricating and assembling them. The economic saving was seen in labor cost rather than in that of the raw material for the average mill cost of duralumin was indicated to be only about 50 cents per lb. even at the present time, while there are few if any airplanes in which the factory cost of the bare structure in its completed form is less than $2.00 per lb. From $4.00 to $8.00 per lb. of structure is a more usual range.



The aluminum alloy crankcase used in the Curtiss Conqueror engine and which has a weight of 48 lb.

Even allowing for wastage, therefore, the cost of duralumin would average about ten per cent of the total cost of the structure of a plane. The figure indicated that experience, in general and where methods of extraordinary refinement were not employed in designing and construction, showed no great difference in efficiency between structures of wood, steel, and light alloys. The economic factor, of course, including such elements as durability and maintainance cost, could prevail in dictating the selection of material in most cases.

Intake manifold of Curtiss engine

Dr. W. G. Harvey, also of the Aluminum Company, spoke on magnesium and its prospects. Magnesium is in somewhat the same state in which the aluminum alloys lay five years ago. The aircraft industry has had but little experience with it as yet and is correspondingly inclined to suspicion. Dr. Harvey passed lightly over the possibilities of pure magnesium, since its strength is quite inadequate for structural purposes, and turned to the high magnesium alloys. A typical example of that class contained 92.6 per cent magnesium, 7.0 per cent aluminum, and 0.4 per cent of manganese. The paper included a table, reproduced in part as Fig. 1.

The properties given in each case are those of the alloy best suited for the work. In some instances material improvement is secured by heat treatment. The alloy of which the composition was given above, for example, gains about 30 per cent in tensile strength, and has its possible elongation and reduction of area nearly doubled, by appropriate treatment.

The alloys have been found to lend themselves well to the ordinary shop processes, although there has been no extended commercial development of die casting as yet. Aircraft parts are now being formed by sand casting, which presents no serious difficulties although it requires a special technique differing from that employed with other light alloys. Forgings are made essentially as in aluminum alloy, and aircraft propeller blades, supercharger impellers, and pistons, among other things have been formed by that process. Dr. Harvey indicated that the dies designed for aluminum alloy forging were in general suitable for magnesium also, although again the technique differs in detail. Extrusion is used satisfactorily, as is rolling. The material hardens very rapidly by cold working, however, and the speaker emphasized the difficulties experienced in cold forming of magnesium alloy sheet, as well as the necessity of frequent annealing of the material between successive passes through the rolls during the process of cold rolling. Obviously magnesium alloy sheet is unsatisfactory for beading into cowlings of double curvature of small radius.

The alloys cut with beautiful smoothness, and take a high polish when machined.

Dr. Harvey's paper devoted some attention to corrosion and its prevention. There has been great improvement in corrosion resistance in recent years, and the alloys including manganese are especially good, about equal to the commonly used aluminum alloys. The paper specifically called attention to the desirability of using protective coatings under severe conditions, and recommended particularly a surfacing of electrodeposited rubber or one of aluminum paint.

REPLYING TO QUESTIONS about the extent of the present use of the magnesium alloys, the speaker said that production of castings had increased two hundred times in three years. He was unable to give full information concerning the availability of magnesium in exhaust manifolds. Experiments had been tried, but he feared that the temperatures near the cylinders would be a little high. He was unable to give full data at the present time upon the fatigue properties of magnesium alloy forgings, but the endurance limit had been found to be about 8,500 lb. per sq.in. for untreated castings and 10,000 lb. for heat treated sand cast parts. The fatigue stress capable of being sustained by forgings through five hundred million reversals was estimated at from 10,000 to 12,000 lb. per sq.in.

The present cost of the magnesium alloys was stated to be considerably higher than that of the corresponding aluminum compounds Generally speaking the cost in castings is twice that of the best aluminum casting alloys, while in forgings it runs about two and a half times the cost of its heavier rivals in the light alloy group Against that economic disadvantage it offers a superiority of strength - weight ratio in the sand cast condition of about 50 per cent over a good casting alloy high in aluminum, according to the tables given in the paper

Fig 1—Mechanical Properties of Magnesium Alloys

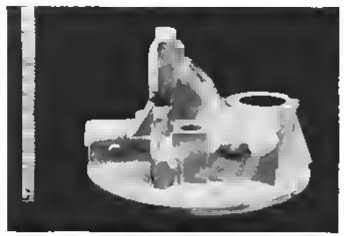
	Sand Castings	Extruded Products	Cold Rolled 14 ga. or under	Rolled Products Annealed 14 ga. or under	Hot Rolled Plate	Light Forgings
Specific gravity	1 80	1 80	1 77	1 77	1 77	1 78
Tensile strength Lb per sq in	26 000-38 000	42 000 45 000	40 000-45 000	37 000-38,000	35,000-36 000	39 000-42,000
Yield point* Lb per sq in	8,000-11 000	22,000-26 000	20 000-27,000	20 000 22 000	15 000-20 000	22,000-24 000
Per cent elongation in 2 in	8-15	11 16	5-10	18-24	10-14	8-15
Per cent reduction in area	9-16	13-20			10-15	8-20
Modulus of elasticity Lb per sq in	6 0 x 10⁶	6 6 x 10⁶	6 5 x 10⁶	6 5 x 10⁶	6 5 x 10⁶	6 5 x 10⁶
Compressive strength Lb per sq in	40 000-50 000	60,000				43 000-55,000
Endurance limit† Lb per sq in	8,500 10 000					

*Considered as the load at 0 1 per cent elongation †Rotating beam 500 000 000 cycles

MR. FRANK W. CALDWELL of the Standard Steel Propeller Company contributed briefly to the discussion He thought magnesium very promising for propeller blades, although still experimental He was especially interested in the relatively high fatigue limit which should reduce the danger of failure due to flutter, and in the fact that the lowered density made it possible to use of a thicker blade section and so cut down the amount of fluttering

Aluminum alloys are a strictly commercial material. Magnesium is on the border line between the experimental stage and that of extended utilization in production The material to which the third paper related, beryllium, is hardly even experimental as yet Dr. H. W. Gillett, Director of the Battelle Memorial Institute explained what little is known about its possibilities

Dr. Gillett started with a frank recognition and regret that so little information existed, but he coupled it with an avowal of a personally optimistic point of view Broadly speaking, according to the paper, beryllium has the same specific gravity as magnesium, the modulus of elasticity of steel, and for an alloy with a small proportion of aluminum a strength in excess of any other light alloy Specifically, the specific gravity is 1 84, the modulus of elasticity is twenty-seven million five hundred lb per sq in , and the strength of thin sheet rolled from an alloy of 70 per cent beryllium and 30 per cent aluminum was given as from 70,000 to 100,000 lb per sq in The high modulus of elasticity would make beryllium especially valuable in the construction of springs and propeller blades and other members that are particularly subject to vibration



Rear end of the crankcase of a Pratt & Whitney Hornet engine with scale showing overall dimensions. The weight of this unit is 16 lb.

Dr Gillett pointed out certain disadvantages which at present appear to attach to beryllium. It seems to be hard to work by most of the standard processes It is so brittle as to make the possibility of any cold rolling or cold working quite doubtful, although the beryllium-aluminum alloys should be better than the pure metal in that respect Both the pure metal and the alloys give troublesome blowholes in casting Dr Gillett especially stressed these points and the necessity of getting enough of the material so that trials of its fabricability can be made "The need for data on this point is the neck of the bottle in the whole situation," he said

Intimately connected with the lack of data on the properties of beryllium is the scarcity and the relatively enormous cost The author mentioned that the cost in this country had been around $200 a pound up to the present time In the course of the discussion it was stated that the firm of Siemens-Halske in Germany were reported to be producing about eight pounds per day for commercial use, at approximately $100 per lb Dr Gillett believed that if a real demand for the material were in sight, the cost could be brought down to less than $50 per pound almost at once, with further reductions in early prospect He pointed out that enormous deposits of beryl are known, and that there need be no uneasiness on the score of exhaustion of the raw material The speaker mentioned, in fact, that some authorities had estimated that the world had more beryllium than lead or zinc Dr Gillett closed by re-affirming his own optimism on the future of the material, but recognizing it as dependent upon further commercial development and a much more liberal expenditure of money on research Lack of financial backing for experiment seemed to him the reason for a temporary impasse during which beryllium continues to be discussed in theoretical and academic terms

Although the other papers of the session were less directly related to aeronautical practice there were two of pronounced interest to the aeronautical engineer Of special importance was the contribution of Junius D Edwards and Cyril S Taylor, both of the Aluminum Company of America on the electrolytic properties of aluminum alloys and other materials in relation to their liability to corrosion

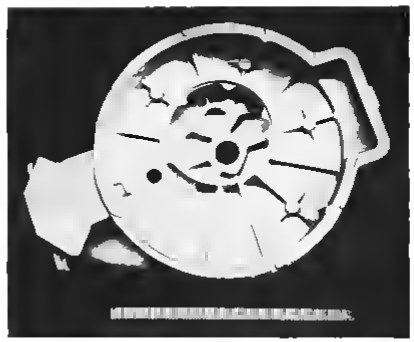
THE PROPERTY possessed by Alclad of extending an electrolytic corrosion protection to the duralumin core, so that it remains unaffected even after a substantial amount of the aluminum skin has been scraped away is now generally known The action conforms to a general rule that when two metals are in contact it is the electrically negative one which is most likely to be corroded, and the greater the potential difference between the two the greater the corrosive influence upon the negative electrode Thus in alclad duralumin is the positive element with a potential difference of about 0 1 volt between the two The corrosive action therefore tends to concentrate upon the aluminum, which is inherently non-corrosive

DOCTORS EDWARDS AND TAYLOR made measurements of potential difference for a great number of other combinations The results indicated that other high-strength aluminum alloys, such as 25 ST and 51 ST, would be less effectively protected from corrosion by an aluminum coating than is 17 ST, since their potential differences are smaller In the case of 25 ST, in fact, at least one test showed the heat treated material to be negative with respect to the aluminum so that the presence of an aluminum coating, should it be broken at any point, would actually increase the rate of corrosion of the core.

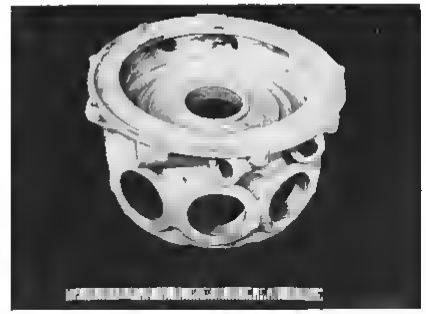
A number of similar experiments were made on aluminum alloys in combination with other metals The most important results can be expressed in tabular form

Aluminum	protects steel slightly
Aluminum	protects iron more strongly.
Steel	protects duralumin
Copper	corrodes duralumin severely
Brass	corrodes duralumin severely
Zinc	protects all standard high-strength aluminum forging alloys
Steel	corrodes 51 ST

Of course the opposite of the above statements is also true, whereas steel protects duralumin the duralumin tends to corrode the steel The potential difference is small enough, however so that as Dornier and others have demonstrated in practice, the combination of duralumin and steel is not really a very dangerous one electrolytically Since zinc is strongly electronegative with respect to all of the high strength aluminum alloys, zinc



Supercharger crankcase of aluminum alloy for the Curtiss Aeroplane and Motor Company



Photograph of the thirty-three lb. crankcase of the nine cylinder Lycoming engine

solder proves very satisfactory as a material for joining them.

In discussing this paper, Starr Truscott of the National Advisory Committee for Aeronautics remarked upon the increasing tendency to the use of aluminum, quite aside from any consideration of economy or average efficiency, as a means of reducing the factor of ignorance in airplane construction He suggested the possible importance of chromium plating on aluminum, and also on other metals placed in contact with aluminum Dr Harold K Work pointed out that chromium plate would not be an electrolytic corrosion preventive.

Dr F. N Speller, of the National Tube Company, spoke in some length upon the relation between corrosion and fatigue limits, citing the case of mild steel as having an endurance limit in air of 35,000 lb per sq in under repeated stress, lowered to 24,000 lb per sq in when the specimen is submerged in water If the submergence were in a salt solution, however, and if the material under test were electropositive with respect to another electrode, the endurance limit would be maintained at the same figure as in air. He said further that indications were that a high-velocity air current over the surface would reduce the fatigue limit much as would submergence, a factor of obvious importance in airplane and propeller construction

The last paper bearing directly upon the practical handling of an aeronautical material was by Leon McCulloch of the Westinghouse Electric & Manufacturing Company and described a new process for coating aluminum without electric treatment Either aluminum or its alloys can be given a white or light grey finish by boiling for a few minutes in "milk of lime" to which a little calcium sulphate has been added Approximately one and a half ounces of the calcium sulphate are used in each gallon of water Boiling the metal for one hour gives a coating of 0.002 in thickness, composed mostly of aluminum oxide Although the coating is less directly resistant to corrosion than that obtained by the anodic process, it is exceedingly adherent, and the author suggested that its very porosity would make it an excellent foundation upon which to apply paints or enamel The lack of any electrical connections makes this process of coating especially suitable in some cases, especially for small or in delicate articles

THE BUSINESS OF *Selling* AND *Servicing* PARACHUTES

By R. Sidney Bowen, Jr.

The profitable invasion of an established market is in itself a merchandising task of no mean proportions However, the creating of a market, particularly one that is ultra sceptical, is a task that calls for 100 per cent merchandising ability In 1925 the Russell Parachute Company was faced with just such a task, and during the first six months of this year, the Company sold over 1000 parachutes This article tells of the methods used to build up that sales volume in such a comparatively short space of time

FACED WITH the double-barreled problems of creating a market all its own, and of convincing that market of the utility value of its product the Russell Parachute Company of San Diego, Calif, manufacturer of the Russell "Lobe" parachute, has in a comparatively short space of time built up a national sales and service organization that might well be used as a pattern by other organizations engaged in the accessory field

When the Company was organized in 1925 the only market available for its product was that afforded by the governmental air services. It was readily realized by the Company's officials, however, that a certain amount of time would be required before a profitable penetration of that market could be made Therefore, attention was directed at the commercial side of aeronautics as a potential market As history shows, commercial aeronautics in 1925 was composed chiefly of a few manufacturers a few struggling operators a few barn-stormers, and practically no pleasure pilots All were working to "get out of the red ink" and to the majority, the additional expense of parachute equipment was not warrantable even though it could be met and in many cases it could not In fact there was the belief among some manufacturers and operators that the presence of a parachute indicated that their planes were not any too safe And, as a result, the Russell Company was forced to combat unfavorable agitation from within the industry itself

Nevertheless, the Russell Company was firm in the belief that a profitable market could be created in the "straggling" industry, and so set about the immediate tasks of dispelling the industry's antipathy toward parachutes and building up a productive selling organization That the belief was well founded is perhaps best exemplified by the fact that during the first six months of the current year the Company manufactured and sold over 1,000 parachutes

The task of building up a producing sales organization was not an easy one, however, and the Russell Company had to be content with its full share of "profit from experience" before representative national distribution and service was attained

At first the company appointed ten dealers to handle Russell 'chutes, and to each dealer was given a definite territory in which to operate His contract was more than liberal and his quota to hold the contract well within the possibilities of his territory Incidentally, the quota was determined upon the pilot population

The results though proved to be far from satisfactory and the burden of building up retail sales volume fell upon the factory It was found that the "closed" territory idea was impractical as far as the sale of Russell parachutes was concerned The dealer contract, stipulating that the dealer would get credit for all sales coming out of his territory tended to cause the dealer to dispose of his quota and then sit back and let the factory build up territory sales while he shared in the profits

In due course "all bets were called off" and a new policy put into practice Under this arrangement, which is now in force there are no closed territories whatsoever Any dealer has the right to sell Russell parachutes any place throughout the United States He is, however, prohibited from buying from the factory for resale to the United States government, or any of its branches As regards the matter of quota to hold the dealer authorization, the dealer must purchase a certain number of parachutes during the course of one year And for every 90 day period of that time he must maintain a stipulated monthly average, else the contract is automatically cancelled In view of the fact that there are no closed territories the number of parachutes to be purchased within one year under contract is the same regardless of the dealer

One qualification for a Russell dealer authorization, and one upon which the Company insists, is that the dealer be an airplane distributor or dealer, or at least be connected with the operation of aircraft at a flying field It is the objective of the Company to supply Russell parachute service at every major field in the country, and therefore linking up with organizations so situated is absolutely essential

Upon signing the dealer authorization the dealer is required to pay list price for his first parachute. Such a requirement is of course merely a means of preventing a "so called dealer" from obtaining one parachute less a discount, and then going out of business For all purchases up to ten parachutes thereafter the dealer is allowed the regular dealer discount However, for lots from ten to nineteen he is allowed an additional discount, and for all purchases of lots of twenty or more he is allowed an even greater additional discount It is understood and written into the contract that all discounts are based on the Company's prevailing list price

To obtain as wide distribution as possible the Company encourages the dealers to appoint sub-dealers wherever they consider it best They must however control the activities of the sub-dealers and see to it that Russell parachutes will be displayed and their sale promoted to all persons engaged in the business of aviation in the localities in which the sub-dealers are operating This requirement which at first glance might seem to be entirely unnecessary, is but one means of carrying out the Company's policy that the dealers and sub-dealers guard against the advent of "dead" stocks on their shelves

The fact that dealers and sub dealers are not restricted to territory sales permits the factory to sell retail throughout the country This practice, however is not taken advantage of to any great extent, the Company officials believing that "factory interference" is not profitable in the long run There are cases though, when the factory does step in, and an example is where it is quite apparent that a certain section is not producing as it should, even though the local dealer is fulfilling his contract as regards purchases At such a time, the factory steps in to "show the boys how it is done", as it were. Or else it appoints additional dealers throughout the section

An action photograph of a parachute jumper floating down to earth with a Russell Lobe parachute

Naturally it would be an impossibility for the factory to efficiently supervise a national selling and service organization from the San Diego plant Therefore the sales manager is continually "touring" the country and visiting the dealers and sub-dealers In addition he is visiting all worth while fields with the idea of establishing new dealers. Perhaps the major part of his activities consists of "teaching" parachute servicing to dealers and demonstrating the Russell products He has a plane and an expert jumper travels with him, and "goes-over-the-side" at various times during the tour. In short the sales manager and his jumper are the factory contacts. They contact the field seek to increase national sales volume and in addition execute what ever arrangements are necessary so that all Russell parachute owners can obtain expert Russell service The factory of course keeps all members of its selling organization well supplied with instruction literature for their benefit and for the benefit of Russell 'chute owners

So successful have been the merchandizing and servicing policies of the Russell Company, that they have developed a national market that is too big to be adequately handled from the factory alone Therefore a factory branch has been opened in New York City to permit better distribution east of the Mississippi River Not only does the New York factory branch make for more rapid delivery of orders but also reduces the express costs to a considerable degree If development continues to be as rapid as at present, it is believed that a mid-western branch will be necessary at an early date.

THE EMSCO "Challenger"

TRI-ENGINED MONOPLANE

FLIGHT TESTS of the Emsco "Challenger" tri-engined cabin monoplane conducted at Long Beach, Calif., with Jack Reid as test pilot, proved the latest of Charles Rocheville's designs to be as efficient as the Albatross series which has preceded it. Since the Albatross Aircraft Corp., of which Rocheville was president, has been purchased by the E. M. Smith interests the new Challenger, and all future designs by Rocheville and his engineering staff will be produced in the new Emsco aircraft factory at Downey, Calif. Mr. Rocheville continues with the Emsco Aircraft Company as vice-president and general manager, and will supervise the development of a complete line of aircraft of single and multi-engine, land and seaplane type.

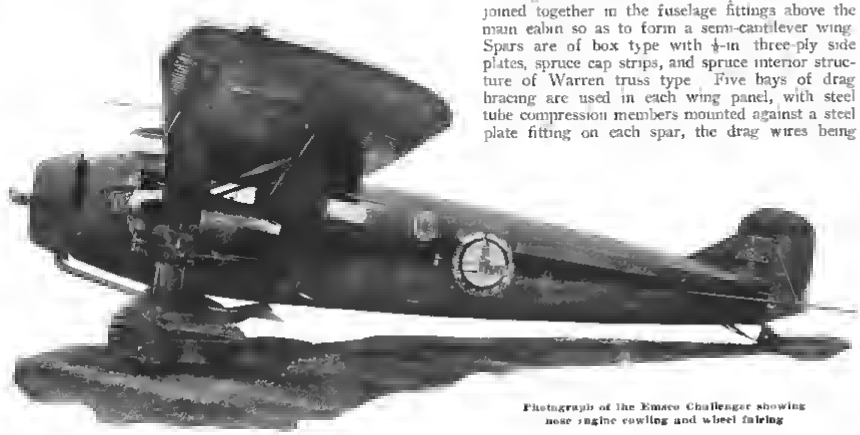
Powered with three Curtiss Challenger six cylinder radial engines, each developing 170 hp. at 1850 r.p.m., the Emsco Challenger is a cabin monoplane of the externally braced type, with a wing span of 57 ft. and a length overall of 36 ft. In flight tests conducted at sea level over the surveyed Navy speed trial course along the coastline north of San Diego, the Challenger showed a top speed of 125 to 130 m.p.h. at 2 000 r.p.m., and a cruising speed of 100 m.p.h. at 1650 r.p.m. Climb at sea level was 850 ft. per min., and service ceiling 15,000 ft., all performance figures being determined with full normal load. Accommodations are provided for six passengers and two pilots, with a lavatory and liberal baggage space in rear. Gross weight of the plane fully equipped and loaded is approximately 5,400 lb.

In flight the Challenger is perfectly stable and may be flown by use of the rudder alone. Under all air conditions encountered the plane has shown steadiness and easy riding qualities. Good muffling of all three engines and sound proofing of the entire cabin has made this an extremely quiet tri-engined plane.

Much of the efficient performance of the Challenger is due to the careful streamlining and proportioning of all exposed parts. Nacelles are neatly faired into the supporting struts, exhaust pipes being carried into the interior of the nacelle and exhausting at the rear tip through a single three-inch pipe. Application of the N.A.C.A. complete engine cowling is neatly accomplished on the nose engine because of the large fuselage cross-section. A true lift curve is carried along all main wing struts and the forward brace strut on each side of the fuselage has been enclosed by a stub wing unit extending out to each nacelle. An individual streamline shroud of light construction is mounted around each landing gear wheel and all landing gear struts are well streamlined. The fuselage is of oval cross-section.

IN FINISH the Challenger is gold, black and has two tones of green combined to give a pleasing effect. Outboard nacelles are natural aluminum, struts, wings and tail surfaces are gold, while fuselage and landing gear are finished in two tones of green, with black and gold striping. Finish around the windows and door is by aluminum metal strips.

Wing construction is in two panels which are joined together in the fuselage fittings above the main cabin so as to form a semi-cantilever wing. Spars are of box type with ¼-in. three-ply side plates, spruce cap strips, and spruce interior structure of Warren truss type. Five bays of drag bracing are used in each wing panel, with steel tube compression members mounted against a steel plate fitting on each spar, the drag wires being threaded through this fitting in such a way that the entire structure is rigidly tied together. The wing curve is a modified Gottingen type. Ribs are of spruce in truss form gussetted with plywood, spacing being varied along the wing according to the air flow encountered. Duralumin sheeting is used over the leading edge top and bottom to give a true curve back as far as the front spar. Wing tips are faired by steel tubing built into the wing construction, a rake of almost six feet being used at the tips. Steel tubing is used along the trailing edges of all surfaces. Ailerons are mounted by plain bearings to three outriggers from the rear spar and are set in a considerable distance from the end of the wing so as to be shielded by the tip fairing. Aileron construction is of wood with a stiff box spar along the leading edge of the aileron. Both wing and fuselage are completely fabric covered and heavily finished with a pigmented dope to give a high gloss finish.



Photograph of the Emsco Challenger showing nose engine cowling and wheel fairing

A front view of the Emsco plane showing the wide landing gear tread

FUSELAGE and empennage structures are of welded chrome molybdenum steel tubing all of which is protected inside and out with Lionoil. All fittings throughout the plane of 1,025 specifications steel, laminated at points of great stress. The fuselage of the Challenger differs somewhat from ordinary practice, but is quite similar to the Albatross type of construction except for the larger cross sectional area. In cross section the fuselage is a perfect oval, this form being carried out in all the main bulkheads which are spaced along the four longerons. Each of these bulkheads is laterally braced with a K type truss, while ordinary truss structure is used longitudinally in rear of the cabin to give a permanently rigid welded steel tube structure. Around the cabin, however, trussing is by oversize steel tubes which have been curved to follow the contour of the oval fuselage without breaking into the interior of the cabin. The strength lost by slightly curving these tubes is compensated for by additional cross bracing above and below the cabin so that a completely unobstructed cabin interior is gained without sacrifice of strength. Fairing of the fuselage is by smooth plywood around the cabin to a point in rear of the baggage compartment, and from that point to the tail of the plane there are sixteen duralumin tubes clamped to the cross bulkheads. Fabric covering is stretched over the entire structure from nose to tail, and finished with pigmented dope.

Entrance to the passenger cabin is gained through an oval door on the left side of the fuselage, a patented folding step-ladder being incorporated in the design. The outside door leads into the lavatory compartment in rear of the main cabin, a second door being provided through which the passenger compartment is reached. In rear of the lavatory is a large baggage space while the lavatory portion is screened by a heavy curtain.

Wide wicker chairs are screwed to the floor of the main cabin, three on each side, with an additional bench in front of the left front chair. Ventilation is provided by ports in the floor and by sliding windows. The cabin interior is finished in smooth plywood with a natural gumwood graining. Two large windows with glass formed to the contour of the cabin are located on each side, and tapestry curtains are draped at each window by means of gold cord holdbacks. Seats are cushioned and finished with tapestry coverings. The cabin floor is constructed of heavy, finely corrugated dural covered with linoleum over which a thick carpet is stretched. A thermos bottle is mounted to the forward cabin wall, two dome lights provide ample illumination and the entire interior is finished with decorative wood moldings, with all hardware heavily nickeled.

The cabin construction is of plywood inside and out over a framework of spruce and plywood boxed around the steel tube fuselage members. Fabric covering is used over the outside plywood and a heavy layer of insulating material is placed between the cabin walls providing insulation from both cold and sound. An altimeter, air speed indicator, and clock are mounted on the forward wall of the cabin above the door to the pilot's cockpit, so that passengers may have a check on the movements of the plane.

THE PILOT'S COMPARTMENT is reached through a door from the main cabin. Ample space is provided for two pilots, a large bucket seat being located on each side of the door. The overhead window is hinged and may be instantly opened to give pilots an emergency exit. A large windshield extends completely around the forward portion of the cockpit, with four vertical panes of glass curved to the arc of a circle so that any of the four panels may be slid in either direction to give pilots such visibility or ventilation as may be needed. Since all structural members are carried below the windshield visibility is exceptionally good. Large pyralin windows are located on each side of the cockpit below the windshield to give the pilots a view of the landing gear and outboard engine instruments.

Controls are of the Deperdussin type mounted on a T stick, with swinging pedal rudder controls and brake controls on the left set of pedals only. All control wires are concealed and protected against the possibility of fouling.

The instrument board, of heavy, finely corrugated duralumin, is mounted across the cockpit in front of the pilots. Oil pressure and temperature indicators and tachometer for the nose engine are mounted on the right half of the board, compass and inclinometers in the center, with altimeter and air speed indicator on the left half. Throttle and altitude adjustment levers for all

The cabin interior looking forward into the control compartment

three engines are mounted in a group below the left center of the board in a position handy to either pilot Light and engine switches are mounted on a separate panel below the left side of the instrument board and the booster control, is mounted below the light panel Outboard engine instruments are mounted in a panel on the inside of each nacelle so that either pilot can easily read all three engine panels A double aluminum fire-wall is built in between pilot's compartment and the engine while a large door may be swung open for an inspection of the rear of the nose engine

A fire extinguisher is lung on the rear wall below the left seat, storage battery is placed on the floor beneath the left seat and the oil tank for the center engine is below the right seat A first aid kit is carried in an aluminum container at the left side of the cockpit and the stabilizer adjustment is by a rachet lever on the left wall All controls are operated by flexible steel cables over Micarta pulleys

All three of the Curtiss Challenger engines are muffled by means of collector rings and long exhaust pipes The nose engine cowling consists of four easily removable segments

RIGID MOUNTING of the outboard engines is achieved by an unusual arrangement of the main and auxiliary struts Instead of extending the main wing struts on a line from the lower fuselage longeron direct to the wing spar fittings, the struts run at only a slight upward slope out to fittings beneath the nacelle from which point the wing struts extend sharply up to the spars and brace struts extend back to the upper fuselage longerons Nacelle structures are then set in above the main struts and are braced to the wing spars directly above by means of two struts to the forward and three to the rear spar, a single fitting being provided on each spar Auxiliary brace struts extend from the wing struts to the spars from a point midway between the nacelle fitting and the wing Such a combination of struts gives the outboard engines a very firm mounting and eliminates any flutter from the wings

Outboard oil tanks are mounted in the nacelles each of the three oil tanks carrying 8 gal, while gasoline is carried in two wing tanks having a total of 130 gal capacity All tanks are of terne plate steel, fuel lines are of copper and have flexible joints and fuel valves from either tank to any engine are located in the pilot's cockpit in an accessible position The present model carries 200 gal of gasoline and tanks of this capacity may be had as optional equipment

Westinghouse Micarta propellers are used on all engines, there being a seven-inch overlap between nose and outboard propeller disks with no noticeable ill effects, said to be due to the ability of the Micarta construction to absorb sound and vibration

Empennage members are of steel tube construction Vertical fin and rudder are of comparatively small area line to the long fuselage, elevators are independent, each being connected by a horn and push-pull tube to a single wire operated lever arm All empennage surfaces are balanced, and each control surface is mounted on three plain bearings The horizontal stabilizer is adjustable by means of a cable-operated lever arm

Landing gear tread is approximately 17 ft, with vertical Aerol shock struts running up to each nacelle wing strut fitting Axles and lateral brace struts are streamlined with balsa wood and fabric while each wheel is enclosed with a light shroud built up of dural tubing and covered with fabric to give a streamline form Bendix wheels with individually operated brakes are standard

A unique tail skid arrangement is offered as optional equipment, the standard skid being a tripod with steel skid shoe and compression rubber shock strut The optional arrangement provides a swivelled wheel, also cushioned with rubber disks in compression. this wheel being pivoted to the standard tripod strut structure For ground handling a large hollow tube extends through the fuselage near the tail and a smaller tube may be slipped into this for lifting the tail

Flying lights, instrument board lights and cabin lights are all standard equipment and landing lights are mounted in each wing in rear of the front spar and near the wing tips A positive mechanism is provided by which the pilot can swing the lights down into position whenever they are needed

Production is being rushed on an order of three planes for the Emsco Derrick and Equipment Co Future production will be carried on in a new $1,000,000 plant on a 70-acre site at Downey, Calif., to which all equipment and personnel has been moved from the Long Beach shop A service shop and test hangar will be maintained at the Long Beach Municipal Airport The Emsco Aircraft Corporation is the latest enterprise of the E M Smith chain

Specifications and performance figures as supplied to AVIATION by the manufacturer

Length overall	36 ft
Height overall	12 ft
Wing span	57 ft
Chord	9 ft
Airfoil section	Modified Gottingen
Wing area	483 ft (approx)
Dihedral angle	1½ deg
Angle of incidence	0 deg
Gross weight of plane loaded	5 400 lb
Power plant	Three Curtiss "Challengers" (170 hp at 1 850 r p m)
Propellers	Westinghouse Micarta

Performance figures—full load still air, at sea level

High speed	121-130 m p h at 2,000 r.p.m.
Cruising speed	100 m p h at 1,650 r p m.
Landing speed	45-57 m p h.
Climb at sea level	850 ft per min.
Service ceiling	15 000 ft
Absolute ceiling	18,000 ft
Gasoline capacity (normal)	130 gal
Range at cruising speed	550 mi

Safety Work IN AVIATION

The National Safety Council Discusses Aeronautical Problems

By EDWARD P. WARNER

ALL WHO WERE PRESENT at the aeronautical safety meetings held in New York City a year ago, in connection with the National Safety Council Convention, and sponsored by the Guggenheim Fund for the Promotion of Aeronautics, will recall the exceptional breadth and variety of the discussion, and the high standing of those who participated as speakers or as chairmen of sessions The aeronautical industry left no room for doubt at that time that it took safety work, in the broadest sense, very seriously, and that its leaders intended to continue their efforts for the reduction of flying hazards The National Safety Council was encouraged to give aeronautical work a prominent place among its activities, and as a result, a second group of aeronautical meetings has just been held in Chicago as one of the features of the Safety Council's annual meeting there

The Chicago program, planned on a much less ambitious scale than that in New York was designed to cover the progress that had been made in the safety work and the analysis of factors of hazard within the past twelve months, and added a couple of points which had not been adequately treated in 1928 There were but six papers, dealing respectively with aerodynamic factors in design, maintenance and air line operation, instruments and radio, the training of pilots, fire prevention at airports, and the hazards attendant on airplane construction Morning and afternoon sessions were held and the papers divided between them

The questions pertaining to maintenance of an air transport service and its safety standards were treated by Lester D Seymour, general manager of National Air Transport Mr Seymour expressed very vigorous views upon the importance of attention to the minute details of organization upon the vital necessity of adequate ground organization before an airline is started especially if it is to carry passengers, and upon the desirability of protecting the public interest by dealing ruthlessly with unsafe operation He dealt especially with the urgency of specialized personnel instruction both for mechanics and for pilots, and of impressing upon the mechanics the serious nature of their responsibility Mr Seymour's conviction on that point was apparently in concord with the view held by various authorities on military and naval aviation, that, inspection and checking can never replace a sense of personal responsibility, and an unwillingness to let anything get by in improper shape on the part of the man who actually does the work

The speaker remarked with some severity upon the occasional tendency to let hangars and shops get into a sloppy condition and to ignore the comfort of those working about the planes He considered the lighting, heating, and ventilating of the buildings a necessary and important safety factor, and he laid weight also on the necessity of guarding all employees against fatigue and consequent relaxation of vigilance

Mr Seymour passed rather lightly over the actual maintenance of the flying equipment considering that the necessity of keeping the airplanes and engines in absolutely flawless condition and making frequent inspections of every detail was so obvious that it need not be stressed, However, he commented at great length upon the vital importance of a weather service and of adequate communication for safe cross-country flying He would, he said, be loath to relinquish any of the existing forms of communication in favor of the exclusive use of any of the other alternatives Radio, telegraph, and automatic teletype transmitter were all being used simultaneously for various purposes, but of particular importance was the maintenance of continuous radio communication between the ground station and the aircraft Taken up comparatively late in American air transport operations, the use of radio has come on with such a rush that Mr Seymour could declare that it took first place among the developments of the past year in its possibilities of increasing safety of flight

THE ALLOCATION of responsibility for deciding whether or not a given flight should be made has long been a controversial point in both commercial and military flying Despite improved ground organization and increased experience of field managers, the trend has been distinctly toward concentrating responsibility in the pilot and placing all dependence upon his judgment Just as it is common practice in military operations for the officer in charge of flying at a field to have the absolute right to refuse clearance to any plane, no matter how sure the pilot may be that he could make his trip safely so Mr Seymour urged that pilots should constantly be impressed mour urged that pilots should constantly be impressed with the necessity of precaution, and of landing or turning back when safety becomes doubtful

The general manager of National Air Transport closed by taking a stand for increased government control of air routes "The speaker wishes to point out that with the rapid expansion of air routes in the United States," he said, "there has come the establishment of a number of routes not provided with all the aids to navigation which we now know If then we are to consider safety first, might it not be just as reasonable for the government to restrict the carrying of passengers over routes not equipped at the present standards, as for them to require certain standards in the instruction and licensing of pilots and in the matter of airworthiness of airplanes?"

Although the speaker did not enlarge upon the point, the inference was plain that he believed that the government having set its hand to the plow of regulation should go on to insist upon a certain minimum of ground facilities and communications before any route was permitted to be operated in regular transport service. It is surprising that there has been so little discussion of that vitally important question in the past, and that the suggestion of government control of air routes and the requirement of a permit for operating them should have been so seldom heard.

THE ONLY PAPER addressing itself specifically and exclusively to questions of airplane design was that of Dr. Michael Watter of Chance Vought Corporation, who spoke on safety factors in aerodynamics. After pointing out how great a part experience has shown aerodynamic design to play as a safety factor, Dr. Watter urged particularly the importance of attention to seemingly small details. The time has passed when air airplane can be designed in terms of a few coefficients given as round numbers. Such factors as the blanketing effect of the body upon the tail surfaces and as the relationship between the wings, tail surfaces, and propeller, Dr. Watter considered to be of especial importance. While those interferences to stress are important at all times, they are particularly likely to be troublesome in the stalled condition.

The author of the paper mentioned the use of wing sections having a very flat peak on their lift coefficient curve, the operation of the ailerons through a differential mechanism, and the installation of Frise ailerons as among the means of improving control in the stalled attitude. For a real solution, however, he felt it necessary to go deeper and to remove the causes of the loss of control at the stall rather than to improve the control mechanism itself. In the more fundamental category of schemes to remove the cause are included the suppression of the boundary layer of air by sucking air into the wing through holes in the surface or blowing it out under pressure through similar openings, and slotted wings. Outlining the history of the slot from its first form requiring manual operation, through the present automatic slot, the author mentions especially the usefulness of a locking device, applied in American installations for holding the slot permanently either opened or closed it desired. As Lieutenant Harper has done in his papers on slotted wings, Dr. Watter laid great stress upon the necessity of very accurate fittings of the slots so that opening of the two sides might be simultaneous. An error of a small fraction of an inch materially effects the nature of the action at the time of opening.

The paper in its discussion of spinning opened rather dishearteningly by emphasizing what is not known, and by calling attention to features in which all the accepted rules for avoidance of flat spinning tendencies have apparently gone astray. The author indicated that the complexity of the spinning phenomena is commonly underestimated, with incomplete "solutions" obtained by unduly simplified reasoning. Reverting to his remark upon the slotted wing, he felt that a powerful rudder control and the protection of the rudder from any blanketing or shielding effect was of the first importance. This is in agreement with certain British experience.

Dr. Watter described as illusory the common belief that the use of slots absolutely prevents spinning. Recognizing their effect upon spinning characteristics and the reduction of the liabilities of falling into a spin, he nevertheless pointed out that there has been repeated demonstration of the possibility of spinning with slots open in certain cases.

Dr. Watter brought his paper near to its close with an enumeration of nine factors affecting spinning hazards. He stressed particularly the necessity of ample lateral control, of a large rudder free from blanketing, the use of horizontal surfaces with a high aspect ratio, and the provision of ample longitudinal stability, which means keeping the center of gravity well forward on the mean wing chord. He was optimistic about prospects for progress not only upon the spinning problem but upon all the other aerodynamic elements of design having a bearing upon hazards.

Training of pilots as a factor affecting safety was treated in a paper by E. P. Howard, Chief of the Regulations Division of the Aeronautics Branch of the

Major Howard C. Davidson, A. C., U. S. A., who spoke on airport fires

Lester D. Seymour, General Manager of National Air Transport

Department of Commerce. Mr. Howard spoke especially of the Department's new rules for the rating of flying schools and for the demonstrated necessity for some rigorous control over training. A year ago an analysis of the Department's accident statistics had shown conclusively the inadequacy of the training being received by many students. Training in spinning prior to the first solo flight was especially likely to be neglected as all emphasis was laid on getting in solo time as quickly as possible. Many schools were operating from dangerously small or obstructed fields. Largely as a result of defective training, about twenty per cent of all accidents were happening to pilots with less than fifty hours flying time. Another indication of the effects of experience and training was furnished by the fact that seventy per cent of all pilots licensed in 1928 received transport licenses but holders of certificates of that grade had only twenty per cent of the total number of accidents. Among the special troubles at that time were: lack of experienced instructors, since good pilots were in great demand on transport lines and generally found that work more attractive than teaching; lack of proper training machines in which the instructors could have full confidence especially for stunting; economic pressure to keep the prices of training to a minimum. Some of these factors still work, but the deficiencies of training planes have ceased to be matter for serious concern since the manufacturers have begun to give special attention to that problem and since the Department of Commerce has caught up with its work of regulation and checking of the structural properties of new planes.

Mr. Howard explained that the Department had had to look on at a very unsatisfactory situation, completely unable to take action, for some time but its hands had now been partially untied by the Bingham Amendment giving authority to rate flying schools upon the request of the owners. He said that the number of applications for rating was steadily increasing as was the proportion of applicants who could show that they were maintaining satisfactory standards. There have been sixty applications for rating as approved schools, of which fifteen have so far been approved, with about as many more pending with a possibility of approval. He estimated that there were a little over four hundred schools in all operating in the United States including a number which are still manifestly unfit as to competence of personnel, adequacy of equipment or proper operating site or all three.

There was practically no discussion upon the papers given by Mr. Seymour and Dr. Watter, but Mr. Howard's contribution drew many comments from the floor. Questions asked by some of the delegates to the Safety Congress not particularly connected with aeronautical work, made it evident how very little knowledge the average intelligent lay citizen as yet possesses of the scope of the authority and the nature of the activities of the Department of Commerce in the aeronautical sphere. In response to queries about the method of enforcement of the Department's regulations proposed, it was explained both by Mr. Howard and by representatives of insurance companies that the insurers might be relied on to give aid in enforcing the regulations and detecting violations, since observance of the Department's stipulations enters as a warranty into aircraft policies and violation renders the policy at least temporarily void. It was also suggested that mechanics and pilots will be slow to risk any violations even if directed to do so by their employers, since their licenses and their personal future careers would be at stake if found out. Mr. Teiler, of Continental Air Service, wanted to know how he could find out the cause of his students being refused their licenses by the Department's inspector, in order that he might correct any flaws in the system of instruction. The speaker agreed that it was desirable that the instructor or head of a school should be informed but pointed out that the student himself already had a definite right to be informed of his shortcomings on request and he believed that a school could best eliminate any bad defects in its system or insure against failure of an unreasonably large proportion of its students by making sure that its facilities came up in all respects to those required by the Department for listing as approved.

Mr. Howard also called attention during the discussion to the fact that certain schools were making more or less direct, but quite fraudulent, claims of having received the Department's approval and to the necessity of checking up on any such claims.

CLOSELY ALLIED with Mr. Seymour's subject was that selected by Prof. William G. Brown of the Guggenheim Foundation, the effect upon safe operation of recent developments in instrument design and in the application of radio. Professor Brown's paper outlined some of the work done in the course of the Foundation's fog flying studies, with special reference to Lieutenant Doolittle's experiences in fog flying. Release of the material for publication was temporarily withheld, and therefore no attempt at abstract will be made.

Safety work in aviation is not limited to the hazards of flight, and two of the papers treated of problems localized upon the ground. Fire prevention at airports is always of importance, and has been of special interest since the National Board of Fire Underwriters took its stand for requiring a copious provision of automatic sprinklers in all hangars. The subject was discussed before the Safety Council by Maj. Howard C. Davidson, commanding officer of Bolling Field. A succession of expensive blazes at that station have made the topics of fire prevention and fire extinction very vital, albeit somewhat hitter ones there.

MAJOR DAVIDSON'S PAPER included an analysis of fourteen fires occurring in Air Corps hangars over a period of about three years. Somewhat surprisingly, it was found that only about one-fifth of the whole number could be charged to causes at all directly connected with or peculiar to aviation, while two-thirds came from defective heating or electrical systems in the building. Heating systems were the greatest offenders, and for obvious reasons most of the fires made their appearance in the winter. There was not a single fire at an unheated tropical post, despite the supposed and frequently discussed dangers of working with extra volatile gasoline in a hot climate. Carelessness of personnel was responsible in several cases, but it was carelessness with blowtorches. In no instance in that group of fires did the violation of smoking rules play a part.

Although the author cited but one case of a fire from that cause, he urged special caution about rubbing metal objects such as tail skid shoes, over a concrete floor. The friction is likely to strike sparks and ignite gasoline vapor. The hob nails in a soldier's shoes have been known to be responsible for at least one conflagration in that odd fashion.

Returning to heating installations as a major element in fire hazard, Major Davidson urged the importance of keeping all fires well away from the buildings where airplanes are housed, in accordance with the common practice in modern construction. The heating unit should communicate with hangar only through hot-air ducts or steam coils, and the use of steam was especially recommended on the basis of Air Corps experience. The paper very strongly recommended a central heating plant for all the buildings around an airport.

For fire fighting, he bracketed the importance of immediate alarm with that of proper extinguishing equipment. Automatic alarm systems should be used in all cases. Of extinguishing fluids, carbon tetrachloride and carbon dioxide appeared to the author to come closest to universal applicability, since extinguishing foam, although very effective against gasoline and oil, is a conductor of electricity and is also likely to freeze up at a little below 32 deg. F. Both foam and liquid extinguishers have, however, been extensively used.

Although Major Davidson's paper was devoted primarily, as indicated by its title to fires in hangars and other airport buildings he closed with some very striking figures on airplane fire hazard, both in the air and after crashes. In the seven years from 1920 to 1926, inclusive, the Air Corps had eighteen fires in the air. In 1927 there were two such fires, in 1928 four. Contrary to the general supposition, very few fires resulted from broken fuel lines. Structural failures of engine parts

ranked first among primary causes, with ignition and carburetor troubles next in order. Of all Air Corps accidents approximately one per cent are fires in flight, and that proportion has remained almost constant. Fires in flight have been responsible, all told, for two deaths in the last nine years of Air Corps operations.

Although there has been progress in increasing the number of hours flown for every fire in the air, the influence of improved airplane design and of the supplanting of war time planes is much better shown by the record of fires after crashing. From 1920 to 1926 more than five per cent of all crashes were followed by fire. Throughout the last two years the proportion has been kept to less than two per cent. The death rate from that cause has been reduced some 80 to 90 per cent during the last five years. Particular success has been attained in safeguarding against the outbreak of fire after a spin into the ground or other major catastrophes, for, of the ten fires after crash listed by Major Davidson as having occurred in the Air Corps during 1927 or 1928, 80 per cent were the aftermath of mishaps in taking off or landing.

The discussion of Major Davidson's contribution centered around the very controversial subject of automatic sprinkler installations in hangars. A representative of the National Fire Prevention Association spoke in favor of the sprinklers. He considered them useful even on gasoline and oil fires although he regretted that it had so far been impossible to arrange for definite tests under practical hangar conditions. He indicated that it was the intention of the Association to issue the much discussed set of rules including definite sprinkler requirements, first prepared about a year ago, merely as recommendations for good practice at least for the time being.

H. M. Matthews of Universal Air Lines, took strong exception to the defense of sprinklers. He found them futile because of the intensity of airplane fires, the rapidity with which they spread and the small area covered and especially because many fires got a good start under the wings or fuselage and could not be reached by sprinklers from the ceiling. He recommended small portable fire extinguishers of the Foamite type.

A representative of the Automatic Sprinkler Corporation agreed that the ordinary type of sprinkler installation was likely to be of but little service in an airplane fire. He felt in particular that the dry pipe type was particularly unsuited for hangar service but a special type of installation had been developed and extensively tested for that service. It included sprinkler heads in the floor as well as in the ceiling throwing water at the blaze from all directions and would thoroughly wet down a carburetor fire within twelve seconds after it broke out. The new system was now being installed in two hangars. The Fire Prevention Association's representative concurred that dry pipe sprinklers were very inferior for airplane work and that special installations were needed.

THE LAST PAPER was that of C. L. Roloson, vice-president and works manager of the Keystone Aircraft Corporation, who briefly discussed the dangers attendant on air craft construction and the means of combatting them. He wrote very forcefully of the importance of good housekeeping in the aircraft factory, with constant attention to cleanliness and ventilation not only in the doping room but everywhere else as well. Mr. Roloson also recited, among other factors having a bearing on hazards, the importance of isolating all processes involving the use of heat or chemical treatments, of concentrating the factory's supply of welding gases and piping it to the points of final use, and of providing ample floor space to avoid overcrowding either around machinery or during the assembly of planes. He recommended compressed-air drive for small tools wherever practicable and the driving of machine tools by individual motors without belting.

IN BRINGING the meeting to a close, Major Reed G. Landis, who acted as Chairman at the afternoon session, gave a brief account of the aeronautical safety work going on in the Chicago district. He explained that it had for some time been the practice of the Cook County coroner to convene a special coroner's jury of aeronautical experts to inquire into each airplane crash. This is believed to be unique as a regular practice. Major Landis himself, is permanent deputy coroner for aeronautical matters at a dollar a year and he has volunteered representatives whose homes and places of business are scattered throughout the county and who are pledged to go immediately to the scene of a crash and at any time. In this way it is possible to get all evidence before it has been destroyed or distorted and to collect the stories of eye witnesses while they have the events still fresh in mind. It was a recommendation of one of the special aeronautical coroner's juries which led to the passage of the present Illinois State law.

Landis told how Major Ralph Royce had received leave from the Army for three months to take charge of the enforcement of air regulations and how he was running instruction courses for the police giving them instruction upon what the regulations contain and also practical experience in gaging the altitude of planes and in identifying their maneuvers.

The first two arrests under the Illinois Air Law were made on the very day of the Safety Council meeting. The last special coroner's jury had recommended that the County authorities undertake to supervise and license flying fields, of which there are now 23 in Cook County, in order to eliminate operation from fields dangerously small or otherwise objectionable.

The present writer in discussion expressed some concern over putting any local government directly into the business of regulating since eminent authorities such as those now doing the work in Cook County could not be expected to give their services gratuitously forever and the regulation might ultimately come under incompetent political control. He suggested as an alternative that State law should prohibit any regular operation of airplanes after a certain date from any field that had not received at least a D-4 rating from the Department of Commerce, thus keeping the technical details in the hands of the Federal authorities precisely as for licensing planes and pilots. Major Landis agreed in principle upon the desirability of Federal leadership and the undesirability of many conflicting sets of local regulations, but pointed out that the bulk of Chicago's air traffic and the great number of fields had constituted a definite emergency and that emergency action had had to be taken as a result.

Several speakers in the discussion paid tribute to the farsightedness of the Chicago authorities in seeking aeronautical work when accidents had to be investigated and suggested the desirability of following that example elsewhere.

Ford Motor Company AND AMERICAN AERONAUTIC DEVELOPMENT

By JOHN T. NEVILL

Three Standard Models Are Adopted; Production Is Increased 400 Per Cent in 1928; Contributions of the Company to Aviation Summed Up

SINCE JUNE 11, 1926, when Maj. R. W. Schroeder, test pilot, flew the first three engined Ford monoplane, the Ford company has produced more than 135 tri-engined planes. Approximately 68 of these have been of the Wright-engined model known as 4-AT, about 59 of the Wasp-powered 5-AT, and three or four of the larger Wright-engined 6-AT.

During this period the Ford Motor Company's airplane factory floor space has been tripled and the number of employees of the aircraft division increased from less than 100 to the present total of approximately 1,650. Chiefly because of Mr. Ford's many experiments in various phases of aeronautical work, no safe estimate can be made of his total investment in aviation but it has been conservatively estimated that the Ford Motor Company has produced nearly $8,000,000 worth of tri-engined airplanes.

Beginning in 1926, both the company's production and operating personnel have been increased steadily except that at several points along the line, steadiness has given way to sudden spurts toward a larger output.

As pointed out in a previous article, the company during 1926 turned out four Wright-powered 4-AT monoplanes, that model being the only tri-engined type produced by Ford at that time. The initial tri-engined craft to be test flown was not completed until June, 1926, and the company did not get into its new plant, with its tripled floor space and modernized facilities until October of that year. As operations were transferred into the new plant the company had about 125 men on the aircraft payroll.

Starting the year 1927 with 150 employees and a production schedule of one plane every three months, the airplane division during that year increased both the production and the personnel bit by bit, completing 12 4-AT's during the twelve-month period. By November, 1927, the company had its plant operating with two continuous assembly lines, the two lines merging into one for the final touches completing the craft.

Early in 1928, the 5-AT, a plane having a longer wing than the 4-AT, and powered by three 410-hp. Pratt & Whitney Wasp engines, was designed. The first of this series was not ready for flight until August of that year. In the meantime, production of the 4-AT had been stepped up from one per month to one every two weeks, and from one every two weeks to one each week.

During the initial six months of 1928 the company produced 11 of the 4-AT series. Then changes were made to increase production considerably. Departments were reorganized to follow more closely the Ford system of progressive production. Additional machinery and equipment was installed. Steel fuselage wing and

Interior view of the Ford-Stout factory at Dearborn, Mich.

various sub-assembly jigs were built to replace those made of wood An ever increasing number of dies were made and are still being made to minimize the necessity for hand labor Overhead cranes were installed to facilitate the handling of cumbersome materials and to carry out more thoroughly the Ford idea of progressive assembly

Where previously as many as 40 men had been required to move a unit from one series of operations to another, whole fuselages wings and other heavy parts could now be moved along the assembly line with only one of these cranes An additional shift of workers was put on, and a program of three tri-engined planes per week outlined

As a result the latter half of 1928 saw the completion of 29 4-AT models and 17 of the new model 5-AT By the introduction of new factory equipment, and new methods, production during the year was thus increased approximately 400 per cent Similarly the personnel had grown from 150 men at the year's beginning to approximately 1,200 men at its close

Of the total 1928 output of 57 planes, 54 were sold to outside interests, many of them going in lots of from three to ten planes to a single operator Notable among such operators were the new Transcontinental Air Transport, Inc National Air Transport Stout Air Services Colonial Air Transport, Northwest Airways and Maddux Airlines The rest of the year's production was probably absorbed by the Ford Motor Company, itself, for use on its own airlines

AS THIS IS WRITTEN, a reliable source within the Ford airplane division estimates that production for the first six months of 1929 was approximately 42 5-AT s 12 4-AT's and three 6-AT's, the latter model being a new type, the first of which was completed May 25 of this year

There is not a wide difference between the three models now being manufactured. The 4-AT produced today differs from the original 4-AT in that the company has ceased using the 220-hp Wright engine, replacing it with the Wright J-6, 300 hp Thus the 4-AT is powered with a total of 900 hp, has a wing span of 74 ft, length of 49 ft 10 in and seats 12 passengers The 5-AT has a wing span of 77 ft 10 in, a length of 49 ft 10 in, seating capacity for 14 passengers and is powered by three 410-hp Wasp engines, giving it a total of 1,230 hp The first of this series was test flown in Dearborn in August, 1928, and shown to have a high speed of 135 m p h, with a cruising speed of approximately 120 m p h One of the first of these models was delivered to Col E A Deeds, of Dayton, Ohio, a director of the Pratt & Whitney Company

The 6-AT, the newest of the Ford products, combines characteristics of the two other models in that it has the wing span of the Wasp-powered craft but uses 300 hp engines instead of the 410 hp Wasps.

The Ford Motor Company is now concentrating production on these three models, with the Wasp-powered type outnumbering the other two The company at present is carrying out a production schedule of four planes per week, this schedule having been announced last June 7. With the completion of the addition to the plant, plans for which already have been drawn up, a production program of one plane a day will be possible.

THE ADDITION will increase the plant's floor space by 155 per cent and will permit the centralization of everything pertaining to the aircraft factory on the Dearborn Airport. About 400 of the 1,850 men now employed in the company's airplane division are located for the present at the River Rouge automobile plant, fabricating steel parts and sub-assemblies This move will mean a material reduction in production cost.

The company's announcement as to the contemplated addition reads as follows

"All of the present buildings at the site of the Ford aviation activities will be retained and additions will be made so as to permit on a larger scale the efficient production and movement of parts toward assembly

"All airplane manufacturing operations will be concentrated in the single factory at Dearborn Provision will be made for the production there of parts now being made in the Rouge plant of the Ford Motor Company, while facilities for the finishing and trimming of the cabin interiors of the big air transports will be so enlarged that twelve planes may be handled on the trim line at the same time.

"Architecturally, the plant additions will be of the style dictated by the airplane They will conform in general appearance to the hangars and to the Ford experimental laboratories in the immediate vicinity of the airplane factory, being long and low so as to constitute no interference for incoming or departing planes at the airport and no barrier to the wide visibility required for flying

"The big increase in floor space will make possible the

Air view of Ford Airport showing hangars and runways

production of one tri-engined all-metal air transport a day Throughout the early part of the year, the production schedule has been three planes a week but a short time ago the rate was stepped up by an additional plane weekly

"Building plans call for the erection behind the present factory of a unit duplicating the present one in size and immediately connected with it as to double the floor space of the plant In addition, on the north end the building will be extended to within about 90 ft of Airport Drive giving still more floor space On the north end of the present plant a mezzanine floor will be built to extend southward a distance of six bays

"When completed the factory will extend 640 ft along Oakwood Boulevard and 253 ft along Airport Drive Its exterior will be of the same materials as were used in the present structure Bedford limestone and fire-clay brick, with steel sash and doors and cement tiled roof The exceptional lighting arrangement and the ventilation system of the present factory will be carried out faithfully in the new buildings At present the factory is 500 ft in length The new building will be 140 ft longer An entrance at the northwest corner, convenient to the intersection of Airport Drive and Oakwood Boulevard will admit to the general offices, the accounting, employment and stock departments the office of the superintendent and others The mezzanine floor will be devoted to the drafting room, employees' rooms, and other uses"

IN CONSIDERING the Ford production figures in relation to those of a majority of other aircraft manufacturers it is obvious that a number of factors must be taken into account For the same reason that railroad coaches and motor busses do not enjoy the wide marketing field of the automobile, the large transport plane of the Ford type does not have the field which is so lucrative to makers of sport type planes Although the Ford Motor Company seems to have had no difficulty in disposing of all the planes the company has produced, its field of expansion is, nevertheless, limited because of the size and cost of planes of its type True, this field has grown miraculously during the past year, and probably will continue to expand for many more years, but the fact remains that the company's production program has been and must be dictated to some degree by the demand at hand By its efforts, co-ordinated with the efforts of the industry as a whole, the Ford Motor Company has bent a powerful shoulder to the wheel, and assisted to an admirable extent in the task of creating the present demand And without for a moment relinquishing any part of its share of the burden, the company now is beginning to reap the rewards of its labors

Another factor that has checked the company's production capacity is this "Were it not for our system of constantly refining and improving our product," a prominent Ford airplane official recently told the writer, our output, since we began concentrating on the tri-engined type, would have been much larger This improvement of design and refinement of character has been, and still is being made, despite a clamor for greater production The tri-engined Ford of today is a result of evolution Since the tri-engined type was standardized by us there has been no product that can be termed a 'new model' or a radical departure from the several products immediately preceding it Friese type ailerons, longer wings, rounded wing tips, landing lights, changes in the depth of chord, new measurements in the cabin and fuselage, new panelling inside the cabin, new engines, new instruments and many other new features were introduced gradually and at such times as their beneficial introduction occurred to the company

"No money is being spared to make the Ford tri-engined monoplane the greatest in the world Since the introduction of the first model 4-AT the gross load has been considerably increased while the weight of the airplane itself has been materially reduced without sacrifice of strength"

IN SUMMING UP, then, the achievements of Henry and Edsel Ford in the field of aeronautics, we note, first of all, the vast number of Liberty engines they helped to build during the World War. Then we see them helping to finance the experiments of William B Stout later supplying him with a factory building and an airport. Next we see them purchase several Stout transport planes and begin their own inter-plant aerial express lines lines later destined to become the first to carry the mails on a private contract basis, and lines, over which, to date, their planes have flown nearly 1,500,000 miles

Subsequently we witness the purchase of the Stout Metal Plane Company, indicating that the Fords had stepped into the aviation industry with both feet Next we see Edsel B Ford sponsoring the first commercial airplane reliability tour, an annual classic that probably has meant more toward the development of reliability and efficiency in America's commercial aircraft than any other one competitive event A few months later a fire destroys the original Stout plant, and the Fords replace it immediately with a plant of which any industry might be proud The Fords then announce that their production will be confined to the multi-engined class, in which, to date, they have produced more than 135 planes valued at nearly $8 000 000 Meanwhile, their production has increased from four planes a year to the present program of four planes a week, with the indication that it soon will be one plane a day

Meanwhile, also, the Fords have developed their airport, equipping it with every modern airport device and making of it one of the finest in the country They have, as well, invested countless thousands of dollars in many experiments and projects akin to the industry Lighter-than-air craft, radio communication and direction finding, meteorology, Diesel and radial air-cooled engines, metallurgy, "flivver" planes, and virtually every conceivable form of aeronautical research have consumed and still are consuming much of the Fords' time and money

Aviation is an "infant industry" no longer Today aviation is in the hands of "big business" and through the medium of that magic touch it has become the fastest growing industry in the world Even though the Ford Motor Company should completely withdraw from the field today, aviation, the industry, owes the company a great deal for being the first of the "big business" interests to pioneer in the aeronautical field.

Therefore, in concluding, we repeat the assertion made in the very first paragraph of the first part of these articles, that ' probably no single event, except for the entry of the government into the air mail field bore more significance to this country's aircraft industry up to 1925 than did Henry Ford's dignified notice published in the Ford *News*, Aug 8, 1925, that his company had launched into the airplane manufacturing business."

This is the eighth and last of the series of articles by Mr. Nevill which have been appearing in AVIATION

GENERAL NEWS

Cord Corporation Acquiring Stinson

Provides Engine Source Through Lycoming Firm

WAYNE (MICH.)—It has been announced through Edward A. Stinson, president of Stinson Aircraft Corporation, that his company has accepted the offer of the Cord Corporation to purchase the Stinson stock at a rate of one share of Cord for two shares of Stinson, or on a cash basis of $17.50 per share to Stinson stockholders. To ratify this change, at least 60 per cent of the Stinson stock must be placed in the hands of the Fidelity Trust Company of Detroit depositary, within 20 days dating from Oct. 1.

In pointing out the benefits of the merger, Mr. Stinson said, "E. L. Cord has been one of the outstanding figures of the automotive industry during the past five years. He has acquired controlling interest in Auburn Automobile Company, Manufacturers of Cord front wheel drive and Auburn cars; Lycoming Manufacturing Company, for years one of the leading manufacturers of automobile engines and which has now entered the aviation engine field; the Columbia Axle Company, producers of axles; Duesenberg, Inc., Limousine Body Company, and other enterprises.

"He has now combined his interests in them into a holding and management company known as the Cord Corporation and intends to enter the aviation field in his usual forceful manner. He offers to purchase the Stinson stock, as above stated to form part of the assets of this holding company and to issue in exchange for Stinson stock to all stockholders who wish to accept it, stock in the Cord Corporation.

"Such action will also provide for the Stinson Company an adequate source of engines and other supplies upon favorable terms."

Money Voted Airship Institute

AKRON (OHIO)—The city council here has voted $100,000 for the Municipal University of Akron buildings at the airport, where a lighter-than-air institute is to be established. The purpose of the institute is to develop airship construction and operation. Some arrangement with the Guggenheim Foundation may be made.

Fisk to Offer Airplane Tires

CHICOPEE FALLS (MASS.)—Airplane tires will be added to the list of Fisk rubber products manufactured here. Deflection and bursting tests on the first models have been successful.

Western Aircraft Show Opens

LOS ANGELES (CALIF.)—The Class C Western Aircraft Show is scheduled to begin here as we go to press, the display opening Oct. 9 and extending until Oct. 16. Approximately 200 exhibitors will display more than $1,000,000 worth of aviation products in the exposition building at Wilshire Boulevard and Fairfax Avenue.

New York Commission Opposes State Air Code

NEW YORK (N. Y.)—At a recent meeting of the New York State Aviation Commission, members went on record as opposed to state regulation of flying at least until other eastern states take up legislation of that type, and decided air regulations be left to the Federal Government. An act, having to do with aircraft registration, aircraft operators and insurance and records of registration for aircraft and operators, introduced by Assemblyman Cantor during the closing sessions of the legislature last March, was discussed.

Other matters brought up included the registering of airports, the requiring of exhibition fliers to have special licenses, the prohibiting of intoxicating liquors aboard a plane unless served by a physician, proposal of a law to prohibit game hunting from the air, and the attitude of the press towards the publication of fatal airplane accidents.

State Senator J. Griswold Webb, chairman of the Commission, presided at the meeting.

French Interest to Thompson

CLEVELAND (OHIO)—A controlling interest in S. A. des Etablissements Mecaniques Monople of France has been secured by Thompson Products, Inc., manufacturers of airplane engine valves here and at Detroit, according to Charles E. Thompson, president. The French company is located at Poissy, a Paris suburb. In France, the Thompson firm will probably produce valves for Gnome-Rhone, Hispano-Suiza, Renault, Salmson and Farman engines. Thompson already supplies Lorrain Dietrich. A large Canadian Thompson Products plant is to be erected on land purchased at St. Catherines, Ontario.

End Cessna-Curtiss Agreement

WICHITA (KAN.)—At the end of this year, the present agreement whereby Curtiss Flying Service has been acting as sales agent for Cessna planes will be terminated, according to a report from Maj. Howard Werhle, general manager of Cessna. Cessna will organize a sales organization of its own.

Name Budwig Assistant Director of Aeronautics

WASHINGTON (D. C.)—Appointment of Capt. Gilbert G. Budwig as Assistant Director of Aeronautics, to have charge of all activities in connection with the approval and licensing of aircraft and airmen by the Department of Commerce, is announced here by Clarence M. Young, Assistant Secretary of Commerce for Aeronautics.

The naming of an assistant director, it was pointed out, was necessitated by the large increase in licensing occasioned by the great growth of commercial aviation. More than 86,000 applications and renewal requests for the various licenses were received during the past three years.

A Transport Pilot and member and prime organizer of the Professional Pilots' Association, Captain Budwig has piloted aircraft for more than 13 yr. He is especially fitted for his new post for during the past year and one-half he has been chief of the inspection of the air regulations division.

In his new position, Captain Budwig will be in close contact with the industry, being actually in the field a large portion of his time conferring with manufacturers and operators in connection with their engineering and other problems as they effect the approval of aircraft and airmen for licensing.

Graduate Large Army Class

WASHINGTON (D. C.)—The Advanced Flying School, Kelly Field, Tex., is scheduled Oct. 12 to graduate 119 students the largest class turned out from that school since the war. Excellent weather has caused the early graduating date which is generally the last week of this month and will give the incoming students more time in which to complete their course. In a period of sixteen months counting this class, a total of 370 qualified airplane pilots have been turned out by the Air Corps. Of the 119 in this class, 47 are second lieutenants in the Regular Army graduated from West Point.

Command-Aire to Market Own

LITTLE ROCK (ARK.)—Announcement is made by Command-Aire Inc., that the firm has elected to withdraw from its sales arrangement with Curtiss Flying Service Inc. effective Nov. 1. On and after that date Command-Aire planes will be marketed independently through the company's own sales organization. The craft will continue, however, to be serviced at the 42 branches of the Curtiss Flying Service, as well as through the Command-Aire dealer organization.

Report Credits Costes With New Distance Mark

PARIS (FRANCE)—Apparently, a new distance record has been established by Capt. Dieudonne Costes and Maurice Bellonte, French aviators, who landed near Tsitsihar, northeast of Harbin, according to a report received here by the Foreign Ministry in a relayed message from Tokio.

Their plane the 'Interrogation Point," evidently covered a distance of some 4,875 mi. from Paris or approximately 375 mi. farther than the record established in 1928 by the Italians Arturo Ferrarin and Carlo Del Prete, on a flight from Rome to Natal, Brazil.

News of the Frenchmen's success was delayed for a week after their forced landing near Harbin. The aviators were able to send word of their safety from a station on the Trans-Siberian Railway and said they would proceed by plane upon arrival of fuel, the lack of which had forced them to land before arriving in Japan. The craft was somewhat damaged, the report continued. The French Consul will aid them in continuing their trip, according to announcements which have been made.

Arrow Plans Foreign Bases

LINCOLN (NEB.)—Plans for establishing distributing bases in foreign countries and U. S. possessions are being considered by Arrow Aircraft & Motors Corporation, of Havelock, Neb. They would be shipped knocked-down and put together at assembly plants. Inquiries concerning Arrow sport planes have been received from seventeen countries within the past few months, it is stated.

Russians at Craig, Alaska

SEATTLE (WASH.)—Reports of the Russian plane, "Land of the Soviets," on its way from Moscow to New York, indicate it was forced down near Waterfall, 12 mi. north of Craig, Alaska, on its flight from Sitka to this city. Two of the crew who reached Craig said the mechanical trouble could not be repaired until a new engine was shipped to them.

Soon to Open Hamilton Propeller Plant in West

BURBANK (CALIF.)—The Hamilton Aero Manufacturing Company, builder of Hamilton airplane propellers, is to occupy a western factory to be completed Nov. 1 at the United Airport, at this city, which is being constructed for United Aircraft & Transport Corporation under the direction of Boeing Air Transport, according to Boeing officials. The Milwaukee plant of the air screw company will continue to operate.

The Hamilton Propeller Company is a unit of the United Aircraft & Transport Corporation, of which the Boeing companies are also subsidiaries. The company plans to use this new plant for manufacturing, testing and experimentation in metal propeller designs and to service propellers requiring factory handling in the West.

Air-Wheels for Swallow TP's

WICHITA (KAN.)—The new "Air-Wheels" produced by Goodyear will be standard on Swallow training planes, according to W. C. Vail, Swallow firm executive. Engineers of the company are now designing a new type of gear to accommodate the Goodyear wheels.

Bennett Race Balloons Before the Take-Off

THE LINEUP OF BALLOONS at the start of the Gordon Bennett international Balloon Race at St. Louis, Sept. 28. At this writing results of official measurements to determine whether Ward T. Van Orman in the "Goodyear VIII" or Captain Kepner, in the Army entry "Scott Field," was victor, are awaited. The "Scott Field" is shown second from the left, while the Goodyear bag is second from the right. Lying third from the left is the Navy entry which took third, giving the United States a clean sweep.

Young Sworn In As Air Secretary

Blee Among Possibilities For Post of Aero Director

WASHINGTON (D. C.)—Maj. Clarence M. Young, former Director of Aeronautics, has been sworn in as Assistant Secretary of Commerce for Aeronautics, succeeding William P. MacCracken, Jr., resigned.

Major Young was born at Colfax, Iowa, July 23, 1889, is a graduate of Drake University, and received a degree of LL.B. at Yale in 1910. He still holds the commission of Major in the Air Corps Reserve and is commanding officer of the 313 Observation Squadron. Entering the Army Air Service in May, 1917, he served eighteen months overseas. During a flight over the Italian front he was shot down by anti-aircraft guns and was held prisoner for five months.

He pioneered in commercial aviation immediately following the war and was one of the first to engage in the sale of aircraft for civilian use. On Oct. 5, 1926 Major Young was appointed Chief, Division of Registration of the Aeronautics Branch and later, as Chief, Division of Air Regulations, built up the aeronautics inspection force which is now carrying out the licensing, identification and inspection of civilian aircraft. This section is also charged with the responsibility of licensing pilots and mechanics and with the enforcement of air traffic rules.

On June 28, 1927, he was appointed Director of Aeronautics, which position he has held until his recent promotion. Among the names that are mentioned most frequently as Mr. Young's successor as Director of Aeronautics is that of Harry H. Blee, present Chief of the Airport Division.

William P. MacCracken, Jr., the first Assistant Secretary of Commerce for Aeronautics appointed to that post on Aug. 11, 1926 by Coolidge was expected to leave New York City Oct. 8 for Chicago. He will attend the annual meeting of the American Bar Association, of which he is secretary, in Memphis the week of the 21st. Mr. MacCracken will probably return to Washington Nov. 1. Later he will become affiliated with the aeronautics industry, it is said. Mr. MacCracken's future plans have not been definitely made known.

Prepare for Guggenheim Test

MITCHEL FIELD (L. I.)—Tests of the Handley Page Guggenheim Safe Aircraft Contest entry are being arranged here. The craft, a sesqui-plane equipped with slotted wings, is powered with an Armstrong-Siddeley Mongoose engine. Preliminary flights have been made by Maj. James H. Cordes, chief test pilot for Handley Page, and by Lieut. Stanley N. Umstead, attached to Mitchel Field, and Capt. Thomas Carroll, official pilots for the competition.

P & W Now Has 24 Service Bases

Large Air Transport Firms Included in System

HARTFORD (CONN.)—Pratt & Whitney Aircraft Company has now established 24 authorized service and parts stations at various strategic points from coast to coast and from Canada to the Canal Zone, according to C. W. Deeds sales manager. The large air transport operators named for this service have facilities especially fitted for the work.

The 24 companies to act as authorized parts and service dealers are as follows:

Universal Aviation Corporation, Chicago Ill., Universal Aviation Corporation, St. Louis, Mo., Universal Aviation Corporation, Kansas City, Mo.; Universal Aviation Corporation, Wichita, Kan.; Pan American Airways, Inc., Brownsville, Tex.; Pan American Airways, Inc., Cristobal, Canal Zone; Maddux Air Lines, Inc., Los Angeles, Calif.; Maddux Air Lines, Inc., San Francisco, Calif.; Southwest Air Fast Express, Inc., Tulsa, Okla.; Boeing Air Transport, Inc., Omaha, Neb.; Boeing Air Transport, Inc., Cheyenne, Wyo.; Boeing Air Transport, Inc., Salt Lake City Utah; Boeing Air Transport, Inc., Reno, Nev.; Boeing Air Transport, Inc., Oakland, Calif.; Pacific Air Transport, Inc., Portland, Ore.; Pacific Air Transport, Inc., Seattle Wash.; Aero Corp. of California, Inc., Los Angeles, Calif.; Aero Corp. of California, Inc., El Paso, Tex.; Stout Air Services, Inc., Detroit, Mich.; Stout Air Services, Inc., Cleveland, Ohio; Northwest Airways, Inc., St. Paul, Minn.; Pan American Airways, Inc., Miami, Fla.; the Pratt & Whitney Aircraft Company, Hartford, Conn.; the Canadian Pratt & Whitney Aircraft Company, Ltd., Longueuil, Quebec, Canada.

To Oppose Fuel Tax in Oklahoma

OKLAHOMA CITY (OKLA.)—Several states allow exemptions or refunds to those using gasoline in aircraft in order to compensate for gasoline taxes originally drafted for motorists, points out W. B. Estes, of the Oklahoma State Chamber of Commerce. The Chamber is collecting information from officials of other states in order to make a definite start in the campaign for tax exemption of airplane-used gasoline in Oklahoma. Exemption is granted at present by Kansas, Arkansas, Michigan, Minnesota, and Iowa. In Alabama, Tennessee, Wyoming, and Nebraska, however, aeronauts must pay the fuel tax in company with those operating cars on the public roads.

To Enlarge Goodyear Defender

AKRON (OHIO)—Plans to add 15,000 cu. ft. to the capacity of the "Defender," newest and largest Goodyear blimp, recently damaged at Detroit, are announced by Goodyear officials.

Loaded Cessna to 18,100 Ft.

WICHITA (KAN.)—Flown by Steve Lacey, test pilot, a standard four-place Cessna cabin monoplane with gross load of 3,350 lb. is reported to have attained an altitude of 18,100 ft. in 1 hr. 10 min. in a recent flight here. Marcellus M. Murdock and Col. H. G. Odell, officers of the Wichita Chapter, N.A.A., and F. H. Dobbe, were passengers.

Aero Exports for July Reach Total of $735,922

WASHINGTON (D. C.)—Department of Commerce, Bureau of Foreign and Domestic Commerce figures for July show the exportation of aircraft valued at $342,122, engines valued at $163,081, and parts, excepting tires, $230,719. This gives a total of $735,922.

Canada led in the number of aircraft received with eight valued at $68,756, while five were transported to Mexico, valued at $59,900. Other countries exported to were Brazil, two for $74,000, United Kingdom, one for $56,400, Japan, three for $54,221, Chile, two for $26,000, and China, one for $2,845.

Panama received fourteen aircraft engines with a total valne of $88,466 while 23 engines were exported to Mexico having a value of $43,300. Engines sent to other countries were as follows: France, three valued at $10,853; Peru, one valued at $7,670; United Kingdom, two valued at $4,100; Canada, three valued at $3,550; Poland and Danzig, one valued at $2,700; and Australia, two valued at $1,529.

A total of $77,545 worth of parts were received by Canada while the second place went to Soviet Russia in Europe with parts valued at $73,769. Other countries to which were exported more than a thousand dollars' worth were Panama, $11,590; United Kingdom, $9,744; Japan, $8,806; Peru, $7,589; Mexico, $7,707; France, $5,241; Cuba, $5,002; Australia, $4,894; Germany, $3,325; Brazil, $3,200; Denmark, $2,742; Philippine Islands, $2,066; Chile, $1,159, and Italy, $1,090.

Test Fire Fighting Chemicals

UTICA (N. Y.)—Utilizing two gasoline soaked airplane wrecks, American LaFrance & Foamite Corporation recently gave a demonstration of airplane fire fighting with Foamite and Alfite at its local experiment station. Besides company officials the event was viewed by Wing Commander L. S. Breadner and Squadron Leader H. Edwards, Canadians.

Bredouw Firm in New Quarters

KANSAS CITY (MO.)—Occupancy of a new building has just been taken by the Bredouw Hilliard Aeromotive Corporation at the municipal airport here. The company is Mid-Western distributor for Wright Aeronautical Corporation and also operates a general airplane and supply business.

Sikorsky Addition Begun at Bridgeport

BRIDGEPORT (CONN.)—Ground has been broken for an addition to the Sikorsky plant here to be used as an experimental laboratory for the engineering department. The building, which will provide 40,000 sq. ft. of additional floor space, will be devoted entirely to engineering experiments with new designs and changes in designs of present planes. Fletcher-Thompson, Inc., industrial engineering architects, are completing the plans.

Further additions to the factory building are expected to be started within a few months. Increase in orders is given as the reason for the expansion. An output of 50 amphibion planes, having a sales value of over $1,000,000, is anticipated during the first year of operation. N. O. Smith-Peterson, general manager, stated that the concern is now employing 300 men, adding to its force at the rate of 60 per month, and expects to have from 1,000 to 1,200 on the payroll within a year.

The plant is located on South Main street, Stratford, a suburb of this city, almost directly across the street from the Bridgeport Airport, operated by Curtiss Flying Service. Sikorsky is using the airport for test flights and other activities at the present time, but a seaplane ramp is being constructed from the rear of the plant into the Housatonic River.

The ramp, which is expected to be ready for use by Jan. 1, is 400 ft. long. Amphibions may land in Long Island Sound, taxi into Stratford Harbor and up the river to the ramp, where wheels can be dropped and the plane run up on land and into the service hangar.

Eight More Planes Approvrd

WASHINGTON (D. C.)—Approved type certificates issued by the Department of Commerce during the week ending Oct. 5, according to certificate, make and designation, type, power plant, useful load, and gross weight, are as follows: No. 240—Waco CS-225, three-place open biplane, Wright R-760, 225 hp., 938 lb., 2,600 lb.; without center section tank, 972 lb., 2,600 lb.; No. 241—Moreland M1, three-place open monoplane, Wright J-5, 800 lb., 2,800 lb.; No. 242—Fairchild 42, four-place closed monoplane, Wright 300 hp., 1,448 lb., 4,300 lb.; No. 243—Cessna DC6A, four-place closed monoplane, Wright 300 hp., 1,248 lb., 3,180 lb.; No. 244—Cessna DC6B, four-place closed monoplane, Wright 225 hp., 1,229 lb., 3,100 lb.; No. 245—Bellanca PM300, four-place closed monoplane, Wright 300 hp., 2,310 lb., 4,600 lb.; No. 246—Ford (Stout), fifteen-place closed monoplane, one Wasp 450 hp., two Wright 300 hp., with center section tank, 5,630 lb., 12,910 lb., without center section tank, 5,330 lb., 12,560 lb.; No. 247—Doyle 02, two-place open monoplane, LeBlond 65 hp., 529 lb., 1,321 lb.

Approved Schools Reach Total of Eleven

WASHINGTON (D. C.)—Recent additions to the list of approved air schools is as follows: No. 8—Curtiss Flying Service, Valley Stream, L. I., Limited Commercial and Private licenses in combination with New York University ground course; No. 9—Universal Flying Service, Lambert Field, St. Louis, Mo., ground and flying (Transport, Limited Commercial and Private licenses); No. 10—Curtiss Flying Service, Grosse Ile, Mich., ground and flying (Limited Commercial and Private licenses); No. 11—California Aerial Transport Flying School, Municipal Airport, Los Angeles, Calif., Transport, Limited Commercial, and Private licenses in combination with Western College of Aeronautics ground course.

Ones previously approved are Airtech Training School, San Diego, Calif.; Aero Corporation of California, Los Angeles, Calif.; Embry Riddle Flying School, Cincinnati, Ohio; Parks Air College, East St. Louis, Ill.; D. W. Flying Service, Leroy, N. Y.; T. C. Ryan Flying School, San Diego, Calif.; and Universal Aviation, Minneapolis, Minn.

Boeing Using Electric Heat Treating Furnaces

SEATTLE (WASH.)—A most modern heat treating department now is included in the Boeing Airplane Company plant, this city, where three electric furnaces with heating chambers 3 5 and 10 ft. respectively are employed. Thermostatically controlled, these furnaces perform more of the steel heating work, while a 5 ft. auxiliary gas oven is available for use in emergencies.

The temperatures of the three electric furnaces are indicated constantly by automatic recording pyrometers. The alloy steel treated consists principally of nickel steel and chrome molybdenum steel which are used in structural tubing, struts, landing gears, axles and similar parts.

The nickel steel is subjected to a maximum temperature of 1 500 deg. F. and the molybdenum steel is treated to a maximum of 1,625 deg. F. After the parts have remained in the furnace the required time they are quenched in oil and become hardened.

D.A.C. Program Outlined

DETROIT (MICH.)—Plans for the development of Detroit Aircraft Corporation along lines such as those of General Motors Corporation were discussed at a meeting of the former company recently when prominent East and Middle West bankers were guests of the company here. Edward S. Evans, president of the Detroit Aircraft Corporation; Harold Emmons, chairman of the board; and Mr. Mayo, chief engineer of the Ford Motor Company, outlined the program.

Increase "Pacemaker" Production

NEW CASTLE (DEL.)—Orders for Bellanca "Pacemakers" have come in so rapidly, that production of them is going ahead on Saturday afternoons and Sundays while the plant operates each night until ten o'clock using two shifts. Craft of this new type are being turned out at the rate of four a week.

Canadian Holding Firm Aequires C.T.A. Service

MONTREAL (QUE.)—Canadian Transcontinental Airways Ltd., has been absorbed by a group of aircraft operating companies having wide ramifications in Eastern Canada. On behalf of Aviation Corporation of Canada Ltd., Denny and Company financial house, has acquired a controlling interest in the Quebec company. Aviation Corporation of Canada, Ltd., it will be recalled, was a recently incorporated company to act as a holding company for International Airways, Ltd., and Interprovincial Airways, Ltd., formerly the Fairchild Aviation Company of Grand Mere, Que. Later Canadian Airways Company, Ltd., was acquired.

Col. R. H. Mulock has been appointed general manager of Canadian Transcontinental Airways, which position he will fill in addition to being general manager of Canadian Airways and International Airways. Robert Cannon, former president, will now be vice president of the Quebec company.

Last year the planes of Canadian Transcontinental flew 56,053 mi. in 544 hr. 1320 passengers were carried and 65,347 lb. of freight and 94,185 lb. of mail transported. The company operated four Fairchild monoplanes, two Loening amphibions, and one Stearman machine which have been taken over by the Drury interests.

Alliance Firm Increases Capital

ALLIANCE (OHIO)—Capital stock of Alliance Aircraft Corporation has been increased from $300,000 to $500,000 and the issuance of 2,000 additional shares of both common and preferred stock has been authorized. Stockholders at a meeting in the company plant here voted to increase the preferred stock 3,000 to 5,000 shares and the common from 3,300 to 5,300. Approximately two-thirds of the stockholders attended the meeting.

Husky Plane Parts to Army

BUFFALO (N. Y.)—Consolidated Aircraft Corporation here has received an order from the U. S. Army Air Corps for an order of spare parts for Consolidated Husky trainer planes, valued at $265,000, according to Ray P. Whitman, assistant general manager of the company, who says the order will be filled within the next few months. Delivery is also to be made to the Siamese Government of spare parts totaling $7,000.

Ten New Airplanes Will Be Offered Soon

NEW YORK (N. Y.)—Reports concerning the development of ten new planes under construction or undergoing tests have been received here recently.

A new two-place monoplane was recently demonstrated by Charles F. Rocheville of Emsco Aircraft Corporation, at Long Beach, Calif.

American Eagle Aircraft Corporation expects to test its latest product, a full cantilever taper wing four-place cabin monoplane, within the next few days.

Twentieth Century Aircraft Corporation, Ravena, N. Y., will start construction of a two-place open cockpit monoplane immediately.

Crawford Metal Airplane Company, Los Angeles, Calif., has started construction of a six-place monoplane to carry a Wright 300 hp. engine. It will have upturned wing tips of the Junkers type, and will use Goodyear "Air-Wheels."

Swift Aircraft Company, Wichita, Kan., has conducted test flights of a new two-place training biplane.

Yunker Aircraft Company, Wichita, Kan., has been testing a new three-place biplane with Wright engine designed by Felix W. A. Knoll.

Taft Airplane Corporation, Elizabeth City, N. C., has conducted test flights of its "Kingfisher" seaplane.

The Hilton Super Mid-Wing monoplane, designed by Ralph Hilton, Wichita, Kan., is expected to be shown soon. It has a Whirlwind 165 engine.

Alliance Aircraft Corporation, Alliance, Ohio, expects to submit a three-place biplane to government officials for approval, within a few weeks.

Kansas City Aircraft Company has its first plane under construction. The company is building a new factory building at Fairfax Airport to cost about $130,000.

Szekely Engines Ordered

NEW YORK (N. Y.)—Additional contracts for SR-3 and SR-5 radial engines have been received by Szekely Aircraft and Engine Company of Holland, Mich., according to the Eastern representative of the firm stationed here. One power plant of the SR-3 type is being delivered to Ward G. Thomas, Middletown, N. J., who is experimenting with a high-wing, one-place light monoplane recently built. He plans to use six SR-5 engines in future productions. Cairns Aircraft Company of Naugatuck, Conn., will use Szekely engines as standard equipment.

Carry Edison Lamps in Ford

CLEVELAND (OHIO)—Fifty electric lamps having the sensitive carbon filament and duplicating throughout the first Edison bulb were flown by a Ford transport recently from here to Detroit. They are to be used at Dearborn Oct. 21 in demonstration of the original perfection of the electric lamp. The delicate lamps were carried without breakage.

Insurance Men Figure Death Rate

Fatalities on Scheduled Flights Put at 1 in 4,000

HARTFORD (CONN.)—On scheduled air routes flown today by licensed pilots, a person runs the chance of death only once in 4,000 times, it has been disclosed in a report of the Actuarial Society of America.

Only thirteen passengers were killed last year out of some 50 000 carried on regular flights, according to figures computed by a committee consisting of J. E. Hoskins, assistant actuary of the Travelers Insurance Company, R. D. Murphy, vice-president of the Equitable Life Assurance Company, and H. R. Bassford, assistant actuary of the Metropolitan Life Insurance Company.

As it was not possible to determine the number of passengers carried on other than scheduled trips, they were not able to work out a death rate for persons of that type. When it came to fatalities among pilots, it was discovered there were 35 for every thousand aviators with Federal licenses for the first six months of 1928 and 25 per thousand the last half of the year.

The death rate among holders of transport licenses reached a total of 32 per thousand, and although this rate may seem surprisingly high for fliers of the most experienced type, it can be explained by the fact they generally do a great deal more flying then pilots in other classifications.

Limited commercial aviators, whose passenger-carrying activities are limited to specified areas, had a mortality rate of sixteen per thousand. Industrial pilots, of whom there were only about 50 active during 1928, experienced no deaths, while private license fliers met death on an average of eight times in a thousand.

Mail pilots, due to their flying operations which are often carried out regardless of bad weather conditions experienced the highest death rate of all, their proportion being 45 in a thousand. Though Army and Navy pilots do a great deal of flying which includes aerobatics their fatality rate was lower than those of commercial pilots.

In considering Reserve and National Guard tabulations hours in the air were used as a basis. During the last three years, the Army Reserve have only had one death in every 3 000 hr. of flying while the Naval Reserve met with a fatal accident once for every 1,200 hr. in the air. The National Guard has even a better record with death coming only once in every 4 800 flying hours.

Milfer Named to Royal Society

BALTIMORE (MD.)—William H. Miller, chief of research of Berliner-Joyce, has been elected an Associate Fellow of the Royal Aeronautical Society of Great Britain in recognition of his accomplishments in aerodynamics.

Solo Endurance Record to Speich

LONG BEACH (CALIF.)—A new non-refueling solo endurance record is claimed here for Vern Speich, Santa Ana flier, who is reported to have broken Lieut. Herbert Foliv's record of 36 hr. 56 min. with a flight of 38 hr. 48 sec., Oct. 2-3. Joe Nikrent, N.A.A. timer, observed the flight.

Great Northern Buys Virginia, Minn., Service

ST. PAUL (MINN.)—Northern Minnesota Flying Service of Virginia, Minn., has been purchased by Great Northern Aviation Corporation, with headquarters in this city, Mark M. Hurd, president of the corporation, announced.

Executive offices of the company will be moved to St. Paul, while the school and flying service will continue to operate from Virginia as the Northern Minnesota division of Great Northern. Lieut. Clinton J. Sigel, president of the flying service, will continue as general manager.

The flying school formerly operated by Lieutenant Sigel has been enlarged and new equipment purchased, making the school one of the best in the Great Northern system.

The Virginia municipal airport, now ready for landing and servicing of planes, is one of the finest in the state outside of the Twin Cities. Paved runways and lighting equipment are now being installed.

Air Law Study at Northwestern

CHICAGO (ILL.)—An air law institute has been founded here by the Northwestern University School of Law. The program of the institute is to furnish an information service to lawyers throughout the country during the year and to hold a summer school during June or July. Prof. Carl Zollman of the faculty of Marquette University's school of law at Milwaukee has been appointed to the advisory board. He is a student of air law.

Helium Plant at Las Animas

DENVER (COLO.)—A factory is being built at Thatcher, near Las Animas, by The Helium Company of Louisville, Ky., on the site of a large deposit of natural gas yielding 7.07 per cent helium, which is nearly 4 per cent more productive of that gas than previous sources. Four and a half million cubic feet will be delivered to the Navy Department this year. The Helium Company has filed incorporation papers in Colorado.

Radio Considered At Safety Congress

CHICAGO (ILL.)—Possibility that the radio will play a greater part as an aid to safe flying than any other development along aeronautical lines in the past year was asserted at the 18th Annual Safety Congress held here.

This point was brought out by Lester D. Seymour, general manager of National Air Transport who was among the many aviation leaders assembled here for the convention. Others of the topics discussed concerned accident causes, blind flying and its progress, need of a more accurate and delicate altitude-measuring instrument, government restriction of passenger lines whose planes are not equipped with latest safety devices, aircraft factory hazards and more adequate ground facilities.

Another topic brought before the Congress members was that of judging when a pilot on a mail and express route should be prohibited from flying in bad weather. It was suggested final decision be left to the pilot and under no conditions should he be made to fly against his wishes.

Savoia-Marchetti S-55 At St. Louis on Trip West

ST. LOUIS (MO.)—On an initial cross-country flight to demonstrate the practicability of taking a large transport seaplane inland the Savoia-Marchetti S-55 has stopped here on its way across the continent from Port Washington, L. I. From here, it will fly to southern cities, including New Orleans, before making a tour of western cities and finally landing at Los Angeles where it will be delivered to a customer.

It is a fourteen-passenger twin-hull monoplane, powered with two Isotta-Fraschini engines set in tandem. The American Aeronautical Corporation is manufacturing seaplanes of this type at Port Washington and is sponsoring the present flight.

Cities already visited include Buffalo, Cleveland, Detroit, Chicago and Milwaukee. Capt. Piero Bonelli, Italian navigator, and Harold Sarey, mechanic, are making the trip which is in charge of pilots William Atwater and E. K. Jaquith.

Add More Seats to S-55

PORT WASHINGTON (L. I.)—Department of Commerce has approved the placing of two seats in the rear of each hull of the Savoia-Marchetti S-55 seaplanes, according to the American Aeronautical Corporation here. They are likened to the rumble seats of an automobile. Facing toward the tail, the seats allow full vision below, above, and to the rear, and occupy space formerly used for storing baggage. Two additional chairs may also be installed in the forward compartment. These improvements have been made by the Italian designers of the seaplane.

Fidelity Firm Joins Aviation Underwriters

NEW YORK (N. Y.)—Owen C. Torrey, of the Marine Office of America, and J. Russell Parsons, of Chubb & Son, co-managers of Associated Aviation Underwriters, announce the formal entry of Fidelity and Casualty Company into the association.

In addition to Fidelity & Casualty Company the other members of this group underwriting aviation risks of all kinds, are as follows: Alliance Assurance, American of Newark, American Eagle, Bankers' Indemnity, Continental, Federal, Fidelity Phenix, Firemen's of Newark, Glens Falls Insurance, Glens Falls Indemnity, Hanover, London Assurance, Marine, Merchants of New York, Merchants Indemnity, Sea, Springfield, and U. S. Guarantee.

The acquisition by the Associated Aviation Underwriters of Fidelity & Casualty and the Bankers', which recently joined the organization, strengthens its ability to underwrite accident, liability, and compensation business. The entire group of Associated companies has assets approximating four hundred million dollars.

It was stated by these underwriters that the rapid growth of the aviation industry has greatly increased the demand for insurance protection against characteristic risks of all varieties.

Sixty Appointed to Air Corps

WASHINGTON (D. C.)—Sixty second lieutenants of the Air Corps Reserve, have been commissioned second lieutenants in the Air Corps, Regular Army, according to an official announcement here. Examinations for the posts were held last June, and the men selected represent 31 states and Hawaii.

Navy Accessory Order To Great Lakes Aircraft

CLEVELAND (OHIO)—A $185,000 contract for aircraft pontoons and accessories has been awarded to Great Lakes Aircraft Corporation by the Navy Department. Deliveries are to be completed within 90 days.

The contract calls for 50 main floats and 90 sets of small wing-tip floats, together with attachments and accessories. These floats are for use on Navy 02-U Vought observation planes, designed for over-the-side and catapult launching. The main floats are 22 ft. in length and weigh only 375 lb. each, being constructed entirely of duralumin.

This order raises the total of business placed with Great Lakes by the Navy to approximately $1,000,000. The order previous to this was for 18 three-purpose bombing and torpedo planes, known as the TG-1 series, and powered with Pratt & Whitney "Hornet" engines.

Instruments Used in Fog Flying Experiments

A GLANCE INTO THE COCKPIT of Lieutenant Doolittle's Consolidated training plane is afforded in the above photograph, which shows the instruments used by the Army flier in his recent blind flying test in which fog landings and take-offs were simulated. Beside the standard Pioneer panel, the four special instruments are shown as follows: 1—visual radio beacon, 2—Sperry gyroscopic artificial horizon, 3—Kollsman sensitive altimeter recording height above the earth within a dozen feet, and 4—extremely sensitive directional gyroscope.

Thomas-Morse On Army Order

Building 70 All-Metal Observation Airplanes

NEW YORK (N. Y.)—Production of 70 all-metal observation planes for the Air Corps is being started by the Thomas-Morse Aircraft Corporation, a division of Consolidated Aircraft Corporation. The manufacture of these planes will involve the sum of nearly one million dollars.

The craft, which will have a wing span of 40 ft. and length of 28 ft., will be known as O-19-B type and constructed of duralumin and steel. They will be powered with Wasp engines. With a gross weight of 4 900 lb., they will be equipped with three guns and 125 lb. of bombs which can be released through a special cockpit. A crew of two will be carried.

Delivery of the first planes will be made shortly after the first of the year and the full order will be completed by July, 1930. As the production increases, the working staff will be increased to approximately 450 men, according to B. D. Thomas, vice-president, chief engineer of the Thomas-Morse company.

Approximately 73,000 sq. ft. of floor space in Unit 4 of the Consolidated Aircraft plant will be used by the Thomas-Morse division. Raymond Ware, secretary of the company, will be in charge of the sales division, while Mr. Thomas will act as vice-president and chief engineer working with Lawrence D. Bell, general manager of all Consolidated interests.

The Thomas-Morse company is developing several other new types embodying their new type of construction, the first of which is an experimental Army pursuit plane powered with a Curtiss Hex 600 hp. engine. The first plane of its type has been completed and is now undergoing test flights by the Army Air Corps at Dayton, Ohio. It is a single seater having a 28 ft. wing span known as the Viper pursuit.

The company is also developing a new type of metal mail plane powered by a 475 hp. Wasp engine which will be capable of handling 1,200 lb. of mail. This plane has a 40 ft. wing span and is 30 ft. in length with large gasoline capacity.

Taper Wings to San Salvador

TROY (OHIO)—Waco Aircraft Company recently shipped three Taper Wings to San Salvador, Central America, for government use and intends sending a representative shortly to instruct native pilots and mechanics in care of the planes. Negotiations are underway with several other South American countries. Recent carload shipments of the Waco company in this country include ones to Tex LaGrone, Kansas City, Mo., C. Dallas, Inc., Buffalo, N. Y., Nilson Mueller, Orlando, Fla., and Houston Airplane Company, Houston, Tex.

Three Portland Companies Band

First National Flying System Inc., is Organized

PORTLAND (ORE.)—Three Portland aviation concerns have been joined under a holding corporation, First National Flying System Inc., with a capitalization of $250,000. The companies are:

Rankin System, Inc., which has syndicated the Rankin System of Flying Instruction to 64 schools scattered all over the United States.

Aircraft Builders, Inc., associate concern formed to manufacture the Student Prince, new two-place training and sport biplane.

Adcox Schools, Inc., well established aeronautical and automotive school.

The subsidiary companies are to retain their identity for operation purposes. The holding company also has all manufacturing and distribution rights to the Davis Safety Control stick, developed by a Portland man.

The first Student Prince plane was given its first public demonstration at the Portland airport Sept. 21 after being given severe private tests at Pearson Field, Vancouver, Wash.

Factory at Portland

No date has been set for the start of manufacturing since the new financial development. A factory site is yet to be chosen although it will be situated in or near Portland, the announcement said.

James A. Malarkey, Portland furniture manufacturer, is president of the holding corporation. Other officers and directors are: George A. Braley, auto dealer, vice president and director; secretary and director, C. R. Peck attorney; treasurer, J. E. Allen, vice-president of the Adcox schools and directors: G. G. Gerber, leading auto repair man; J. Kegerreis, president, Rankin System; Professor Klemin, Charles J. McPherson, oil burner manufacturer; John W. Parker, oil importer and manufacturer; and E. J. Swindells, furniture manufacturer.

A list of stockholders made public includes the names of many prominent capitalists and manufacturers.

Coordinated Instruction

A systematic coordination of effort between the three subsidiary companies is planned. Elementary airplane instruction will be given in schools served by the Rankin System syndicate. Graduates of those courses will be enrolled in the Adcox school for advance work in airplane construction and kindred studies. The factory of Aircraft Builders expects to recruit its skilled workmen from students in the Adcox school. Market for the planes will be created by the flying schools.

It has been pointed out that the Rankin School of Flying is not connected with the new holding firm, being a separate organization.

Glides Two Hours at Cape Cod

SOUTH WELLFLEET (MASS.)—This year's gliding record was reported established here recently by Rolf von Chingensperg, instructor of the Cape Cod Glider School. He made a flight of two hours and seven minutes. The American gliding record was made in the summer of 1928 by Peter Hesselbach who stayed aloft four hours and five minutes, but this does not begin to approach the German world mark of over seventeen hours.

Aviation Corp. Forms Transportation Division

NEW YORK (N. Y.)—Establishment of a Transportation Division by The Aviation Corporation is expected to speed up and facilitate traffic on the 10,000 mi. of airlines controlled by that corporation. The company also handles fifteen per cent of this country's air mail poundage and nearly fifty per cent of the number of air passengers.

Graham B. Grosvenor, president of The Aviation Corporation which is a $20,000,000 holding and development firm, announced the appointment of Tom Hardin, former vice president and general manager of Southern Air Transport, now a subsidiary of The Aviation Corporation as director of operations in this new division. He will be assisted by Robert J. Smith, formerly general traffic manager of Southern Air Transport. These two men will coordinate the operations of Universal Aviation Corporation, Colonial Airways, Embry-Riddle Aviation Corporation, Interstate Airlines and Southern Air Transport among other companies.

Louisiana to Draft Air Code

BATON ROUGE (LA.)—Aid of the Louisiana Highway Commission and mayors will be sought by the recently appointed state aviation committee for the purpose of drawing up an air code similar to Federal regulations and getting communities and highways airmarked. Plans for emergency landing fields and data available to towns planning airports, is also another aim of the group which is headed by Travis Oliver, president of the Delta Air Service and of the Central Trust and Savings Bank of Delta. He is assisted by T. H. Taylor, New Orleans, and James T. Amiss, Baton Rouge. An attempt will be made to put some legislation before the next session of the legislature.

Goodyear Blimps to Florida

JACKSONVILLE (FLA.)—W. C. Young, manager of the aeronautical department of the Goodyear Rubber Company, Akron, Ohio, announces that the company is making plans to winter four of the Goodyear lighter-than-air ships in Florida this season. Both Miami and St. Petersburg are building hangars costing $30,000 to help house the ships.

Russell Tour Brings Many Chute Contracts

NEW YORK (N. Y.)—The Russell Parachute Company, San Diego, Calif., has just completed a 10,000 mi. aerial survey through Edwin Magruder, factory representative. The tour, taking him through the West, Southwest and South, included visits to air transport lines, schools, dealers, and others connected with the aeronautical industry. Demonstration jumps were made at airports and landing fields. Companies with whom Mr. Magruder made contracts for chutes included Advance Aircraft Company, Troy, Ohio; Aero Supply Company, Wichita, Kansas; Central Air Terminal Co., Chicago, Ill.; Curtiss Flying Service, New York City; East Coast Aircraft Sales Corporation, Boston, Mass.; Embry-Riddle Company, Cincinnati, Ohio; Eastern Aeronautical Corporation, Newark, N. J.; J. A. N. Aircraft Company, Detroit, Mich.; Knapp Flying Service, Ypsilanti, Mich.; Parks Air College, East St. Louis, Ill.; Thompson Aeronautical Corporation, Cleveland, Ohio; Washington Airport, Inc., Washington, D. C.; Interstate Airlines, Incorporated, Evansville, Ind.; Dennison Airport Operating Company, Atlantic Mass.; National Aircraft Supply Company, Milwaukee, Wisconsin; C. Dallas, Inc., Buffalo, N. Y.; Robbins Flying Service, Akron, Ohio; Aviation Country Club, Hicksville, Long Island, N. Y.; Robertson Aircraft Corporation, Anglum, Mo.; Southern Air Transport, Fort Worth, Texas.

Lindbergh, Scientists Begin Maya Expedition

BELIZE (BRITISH HONDURAS)—Flights over the jungle land sections formerly the site of Maya civilization have marked the start of the Lindbergh Archaeological Air Expedition which left here recently. Col. Charles A. Lindbergh is the only pilot in the party although his wife has had some experience handling a plane.

According to the plans, landings will be made here at the end of each day though there are chances the plane may land in the interior if a suitable spot is found. Dr. Alfred V. Kidder, head of the Archaeological Department of the Carnegie Institution is being assisted in his observations and work by Dr. Oliver Ricketson of the same institution who is regarded as an authority of Maya history.

Keystone Adds New Building

BRISTOL (PA.)—Keystone Aircraft Corporation has moved some of its activities into a new building which adds some 50,000 sq. ft. to its quarters here. Airport Development and Construction Company of Philadelphia, which acted as consultant and construction engineer for the recently-dedicated Central Airport, Camden, erected the structure.

PERSONNEL

EARL S. BETTS has been appointed director of publicity for National Glider Association. Mr. Betts was formerly publicity director for Redpath Chautauquas, and chairman of the aviation committee of Detroit Adcraft Club.

MAJ. D. R. MCLAREN, manager in British Columbia for Western Canada Airways, has been on fisheries patrol service with a base at False Creek.

JULIAN LYLES, former division traffic manager of Texas Air Transport in San Antonio, has been made assistant general traffic manager of Southern Air Transport. FRED MCCONNELL will fill the San Antonio position.

W. G. FERSTEL, recently district passenger agent in Chicago for Illinois Central System, has been appointed general traffic manager of Continental Air Services, Inc.

CLAUDE F. GILCHRIST has been made operations manager for Central Airlines division of Universal Aviation Corporation.

LOUIS D. STRICKLER, sixteen years old, graduate of Parks Air College, has been appointed demonstration pilot by Curtiss Flying Service in Pennsylvania.

CAPT. KENNETH B. COLLINGS has been appointed chief pilot for Gates Aircraft Corporation.

RICHARD B. BARNITZ has been named by the city council as director of municipal airports at Los Angeles, Calif.

L. J. LEWALLEN has been appointed director of aviation training sales for Universal Aviation Schools division of The Aviation Corporation.

"PAT" MURPHY, former assistant to the general traffic manager of T.A.T., has been appointed director of sales promotion and advertising for Detroit Aviation Corporation.

FREDERICK N. SCHUSTEOT has been appointed airport engineer for Leonard Macomber, Inc., Chicago, constructors of airports and golf courses.

MILTON A. FUECY has been made city passenger agent for Marner Air Transport at Spokane, Wash.

LIEUT. HARRY A. SUTTON has begun his duties as supervisor of technical equipment for The Aviation Corporation.

A. C. ECKMAN, chief pilot of Alaska-Washington Airways, has been transferred from the Alaska-Seattle to the Seattle-Vancouver run.

CHARLES MCLEAN, former aviation editor of the New York *American* has been appointed aviation editor of the Detroit *Free Press*.

WM. H. JACKSON has been made special supervisor of Axelson Aircraft Engine Company. RAYMOND E. IMHOFF becomes purchasing agent for Axelson Machine Company.

LOUIS FIRSHT, former Detroit correspondent for AVIATION, is assistant manager of the 1929 National Air Tour.

MARION TAYLOR, recently aviation editor of the Detroit *Free Press* has joined the staff of Curtiss Flying Service in Detroit.

CADEN JENKINS has been appointed as special representative in charge of sales promotion for the Aero Corporation of California, Los Angeles, Calif.

KING H. YOUNG, formerly general traffic manager of Southwest Air Fast Express, has resigned his position to re-enter the newspaper field. R. A. FLEMING, formerly general traffic manager for National Air Transport, has taken this position with S.A.F.E.

AXEL SWANSON and V. F. POWERS have been transferred from the Braniff division of Universal to the Cleveland division as pilots.

W. L. CAMPBELL has been appointed resident manager for Boeing Air Transport at Burbank, Calif.

Schools and Colleges

NEW YORK UNIVERSITY, in co-operation with the Daniel Guggenheim Fund Committee, offers four courses on aviation in its regular fall semester curriculum. Five courses will be included in the special aviation short course to begin Oct. 14.

PARKS AIR COLLEGE, East St. Louis, Ill., reports the sale of 147 courses during September.

VANCOUVER (B. C.) TECHNICAL SCHOOL is offering an airplane construction course.

ST. LOUIS-UNIVERSAL FLYING SCHOOL graduated its third class, comprising fourteen students, recently.

MICHIGAN STATE AVIATION SCHOOL offers night classes in meteorology and navigation under the instructorship of Donald Post.

PORTLAND AIRWAYS, INC., has taken over the aeronautical instruction branch of Hill Military Academy, formerly operated by Hill Aeronautical School, Portland, Ore.

CENTRAL TECHNICAL SCHOOL, Toronto, Ont., offers an evening class in aircraft mechanics.

BOEING SCHOOL OF AERONAUTICS, Oakland, Calif., reports an advance registration of 95 students prior to its opening Sept. 16. One week later, a total of 125 students had been enrolled.

VON HOFFMANN AIRCRAFT SCHOOL, St. Louis, has inaugurated a special mid-week course on airplane engines only, an eight weeks' airplane mechanical course, and a six weeks' welding course.

Representatives Named

TRAVEL AIR—Curtiss Flying Service, St. Louis, Mo.; Leland Peoples Tulsa, Okla., H. C. Lippiatt, Los Angeles.

BUTLER—Albuquerque Airport, Albuquerque, N. M.

RYAN—Lancaster Airways, Lancaster, Pa.

RANKIN "STUDENT PRINCE"—Associated Aircraft Corporation Los Angeles, for Southern California.

DAVIS—Aero Corporation of California Los Angeles for Southern California.

TRADE TIPS

It has been reported that

Mayor T. R. Finley of Santa Barbara, Calif., has appointed J. J. Mitchell chairman of a committee to select a site for a municipal airport.

The Chambers of Commerce of Pacoima and San Fernando, Calif., have selected a 240-acre site for an airport to serve both communities.

Thomasville (Ga.) city council has taken a 5-yr. lease on a 215-acre airport site.

An administration building 45 x 100 ft. is being planned for the Fort Worth, Tex., municipal airport.

Business men of Sedalia, Mo., are planning to build an airport.

An open competitive examination for senior aeronautical draftsmen will be held by the United States Civil Service Commission at Wright Field, Dayton, Ohio. Applications must be filed by Oct. 31.

The Lincoln Airways, E. J. Sias, manager, is planning erection of 80 x 100 ft. hangar at the airport of Lincoln, Neb.

The city of Miami, Fla., has granted permission to the Viking Flying Boat Company to erect a $15,000 hangar at the Venetian causeway, municipal seaplane base.

The city manager of Long Beach, Calif., is considering bids for construction of a hangar, office building and gas and oil station at the municipal airport.

New Firms Announced

WESTERN AIRCRAFT DISTRIBUTORS, San Francisco, Calif., capital $150,000, by C. T. Eastman, R. A. Newall, W. H. Ruddell, to deal in aircraft.

THE SOUTHERN FLYERS, INC., Chattanooga, Tenn., to deal in aircraft and conduct a taxi service.

OREGON PACIFIC AIRLINES, Portland, Ore.; capital $10,000; by E. W. Haines, V. A. Johnson, T. B. Handley.

PIONEER FLYING SERVICE, Portland, Ore.; capital $5,000; by Cecil J. Pounder, L. L. Pounder, Earl T. Pounder, to conduct a flying school.

PACIFIC AEROMOTIVE CORPORATION, Seattle, Wash., by Willard H. Mohlor and Alf Haugan, to deal in airplanes.

ALAMOSA AIRPORT, INC., Alamosa, Colorado; capital $50,000; by C. H. Woodward, A. F. Bethman, W. D. Sheelef.

NORTHEAST AERO CORPORATION, New York N. Y., capital $20,000 by Philip Kraut, David Devarez, Max Singer to deal in aircraft.

ASSOCIATED AIR SERVICES, LTD., San Francisco, Calif.; by E. P. Kayser, S. G. Whittelsey, H. W. Klee, H. J. Sabalot, M. S. Sonna, Thomas F. Butler, M. L. Gorman, R. S. Gorman, A. P. Mantz, to deal in aircraft, operate a taxi service and conduct a flying school.

BRIEFLY

Air Mail service between Miami-Atlanta-New York will be doubled, beginning Oct 15

Boeing Airplane Company has moved into its new $70 000 hangar at Seattle, Wash

Wausau, Wis, plans to construct an electric beacon of 8 000 000 cp. on Rib Mountain the highest point in the state

Approximately 5 845,000 lb. of air express were carried in the United States during the past three years according to statistics issued by the Department of Commerce

Radio apparatus for transmission and reception of weather reports has been installed at the Springfield Mass., airport.

National Aero Reserves has been formed in Kansas City to promote flying and interest in aviation Sidney Q Noel is president Harry C Dille, vice-president Clifton R Coleman, executive secretary.

Officials of Ohio Bell Telephone Company have agreed to co-operate with the state bureau of aeronautics in securing reduction or elimination of the wire hazard along the limits of airports.

A total of 11 723 persons either arrived at or departed from Los Angeles by air during August.

Pickwick Airways has added another Ryan brougham to the fleet of ten planes operating on its route from Los Angeles to Mexico City

Sanders Air Service, Inc, has opened a combined automobile and airplane service station at Los Angeles Metropolitan Airport

The Austin Company, Cleveland, has been awarded a contract for the construction of a hangar 100 x 120 ft at Colonel Green's Round Hill Airport, near New Bedford Mass It will cost $40 000

Boston Chapter of National Aeronautic Association held an air meet followed by a tea dance at Boston Airport Oct 4

New York Automobile Club has established an air travel division

The new Donaldson lighting system at Grosse Ile Airport Detroit was inaugurated with a series of successful tests on Oct 3

Figures for the first year of operation of the Montreal-Toronto service show an efficiency of 96 3 per cent with 100 per cent for three summer months just completed Planes operated by Canadian Airways, Ltd flew 184,258 mi, with 14,973 lb of mail.

Fairbury Neb held an air circus Sept. 28 to raise funds for an airport

Public Service Company of Northern Illinois has purchased an S 38 Sikorsky amphibion with two Pratt & Whitney Wasps, for patrol and other business purposes

Lady Heath, who was injured at the National Air Races has almost completely recovered and plans to fly again.

All Army flight surgeons assigned to the Air Corps hereafter will receive 10 hr dual flying instruction

An airplane will lead the drive of 3,000 reindeer recently purchased by the Canadian Government from Kotzebue Sound in Arctic Alaska to Kittigazuit Peninsula in the Northwest Territories of Canada

Test flying for Emsco Aircraft Corporation is now being conducted on the company's new 75 acre field

National Air Transport carried 205-134 lb of air mail during August showing an increase of 14 060 lb over the previous month

"Red" Harrigan test pilot for Ryan Aircraft Corporation has flown more than two hundred Ryan planes on their trial flights without having a single accident

Five new Avro Avians built by Ottawa Car Manufacturing Company were delivered recently to Royal Canadian Air Force training center at Camp Borden, Ont

The Aeronautics Branch has ruled recently that the maximum load of Ford tri-motored Wasp planes of the Southwest Air Fast Express may be increased from fourteen to fifteen passengers Seating arrangements have been altered to accommodate fifteen passengers comfortably

Plans for carrying 1,000 000 passengers on short flights next year at $1 per ride are being made by the American Society for Promotion of Aviation, which this year sponsored two flying circuses which carried 60,000 persons at that rate

Southwest Air Fast Express announces the opening of ticket offices in the automobile clubs of Detroit, Cleveland and Cincinnati

A new assembly building at Lambert St Louis Field has been completed for the production of the Curtiss "Thrush" six-place cabin monoplane

The reported merger of Dayton Airplane Engine Company and Eastern Aircraft Corporation is still in the negotiation stage.

Esquimalt has been decided upon as an airplane base for Victoria, B C

University of the South, Sewanee, Tenn., will take its football team to and from a game in Mexico City, by airplane Yale University Aeronautical Society has arranged excursion rates for students desiring to fly to the game with Georgia University at Athens

Two glider clubs have been formed at South Bend Ind, with a total membership of about 70

Fairfax Airport Inc, Kansas City, Mo, receives an income of $950 daily from natural gas produced at the field

A preliminary survey for an electric power line between Bridge River and Vancouver B C was recently completed in four days by airplane.

Pan American Airways has been carrying passengers from Miami to Havana who would ordinarily use the railroad service, as a result of damage to the track between the mainland and Key West

New York New Haven & Hartford Railroad has arranged the schedule of some of its trains for direct connection with T A T service

Firm opposition to further state legislation for controlling airplanes was developed at a recent meeting of New York State Aviation Commission

It is reported that with the placing of $1 000 000 new capital in the business control of General Airplanes Corporation, Buffalo N Y has passed to new interests It is said that present officials will be retained.

Consolidated Aircraft Corporation of Buffalo is testing a new high wing eight passenger monoplane said to be capable of a 155 m p h cruising speed

The air lines across Lake Michigan with terminals in Milwaukee and Grand Rapids Mich, are offering ten-ride commutation tickets at a rate reduction

AERONAUTICAL CALENDAR

Oct. 5-21	National Air Tour Starting from Ford Airport, Dearborn Mich
Oct 14	Regional Airport Conference Atlanta Ga
Oct. 22	Aeronautics program A S M E Akron during convention to be held Oct 21 23.
Oct. 24-25	Conference on Municipal Airports at Washington D C under auspices of the American Road Builders Association
Oct. 31	Discussion of airport paving at Eighth Annual Asphalt Paving Conference West Baden Ind Oct. 28-Nov 1
Nov 7 8	All Western Airport Conference, Los Angeles, Calif
Nov 8-10	Intercollegiate Aeronautic Conference, Columbus Ohio
Nov 9-17	Western Aircraft Show Los Angeles,
Nov 16	Lehigh Airport Design Competition Closes Lehigh Portland Cement Company
Dec. 10 16	National Aviation Week, Mexico including air show and air display at Mexico City
Dec. 16	Regional Airport Conference for New England Bridgeport Conn
1930 February	National Air Show, auspices Aeronautical Chamber of Commerce St. Louis
Feb 5-12	New York Aviation Show, auspices Aviation Post, American Legion
Mar 6-15	Second Annual Pittsburgh Aircraft Show Motor Square Garden Brown Boulevard Pittsburgh Pa Office at Aero Club Pittsburgh, William Penn Hotel
April 5-13	All-American Aircraft Show Detroit
May 3-10	New York Aircraft Salon auspices Metropolitan New York Division, Distributor-Dealer Section Aeronautical Chamber of Commerce at Madison Square Garden New York City
AIR MEETS	
Oct. 18-21	Denver, Colo, Municipal Airport dedication [illegible]
Oct. 19-20	Air Circus at Utica N Y Municipal Airport.
Nov 5 7	Air Carnival, Municipal Airport Omaha Neb
Nov 11	Air Meet Ranger Tex Airport
AIRPORT DEDICATIONS	
Oct 14	Tennessee's Sky Harbor Murfreesboro Tenn
Oct 20	Curtiss Reynolds Flying Field Glenview Ill
Nov 11	Duluth Municipal Airport Duluth Minn
Nov 15	Curtiss-Steinberg Airport, St. Louis Mo.
Nov 15	Kinsolving Airport Abilene Tex

AIRPORTS AND AIRLINES

Special Lighting For Columbia Gorge

WASHINGTON (D C)—Installation of airway beacons through the Columbia Gorge on the Portland-Pasco airway presents a problem not hitherto encountered, according to Capt. F. C. Hingsburg, chief engineer, Airways Division, of the Department of Commerce It is highly desirable to route the planes through the Gorge, in spite of the difficulties, because during the winter months continual rains and low ceiling, he reports, make any other line considerably more difficult Wind currents in the Gorge make it possible to get through there when flying elsewhere would be impossible

The Gorge is rather narrow about 2 or 3 mi. in width, with high embankments on each side In order that flying may take place at night without the danger of side-hill collisions, it is necessary to resort to a new type of lighted aids It has been decided to try out a sign in a form of the letter "T" which will be mounted at the projecting points at the elevation of flight on both sides of the Gorge and point out the direction in which the airplane must necessarily fly to get through

On account of the lack of commercial power, it will be necessary to establish aero-electric generators for furnishing current to the electric signs The lights placed in this sign will be similar to the boundary light units used on the intermediate landing fields and will be spaced uniformly 10 ft apart It is believed that the spacing of these lights will enable the pilot to determine distances at night as he approaches the lights and give the lights the margin that is required to get through safely

S.A.F.E. Adds New Line

DALLAS (TEX)—Daily round trip service between Dallas and Wichita Falls was inaugurated Oct 1 by the Southwest Air Fast Express This service will connect at Wichita Falls with lines to Tulsa, Kansas City and St Louis A plane leaves Love Field daily at 8 30 a m, arriving Wichita Falls at 9 55 a m Returning the plane will leave Wichita Falls at 3:20 p m, and arrive in Dallas at 4 30 p m

Omaha-St. Louis has Night Mail

OMAHA (NEB)—Night air mail service between Omaha and St Louis over Universal Air Lines was inaugurated with the departure of the first plane at 1 10 a m, Oct 2 The mail planes will leave daily at the same time, making the trip in about 4 hr.

Special Rates For Blind Passengers

TULSA (OKLA)—Blind air travelers in the Southwest may be able to travel without charge in the future as a result of a ruling announced by officials of both Southwest Air Fast Express and the Braniff Air Lines. On both lines the blind passenger and his escort will be carried for the price of one fare a practice which has been in vogue with many railroads for some time.

Middle States Adds Stop

CLEVELAND (OHIO)—Starting this week planes of the Middle States Air Lines Inc, of Akron, which operates between Pittsburgh, Akron and Detroit, will stop at Cleveland This will give Cleveland another passenger line to Detroit and Pittsburgh

Radio Sets Installed By Northwest Airways

MINNEAPOLIS (MINN)—Radio receiving equipment is now being installed on transport planes of Northwest Airways Inc, operating air mail and passenger service between the Twin Cities, Chicago and intermediate points Order for the equipment has been placed with the Radio Corporation of America the sets to cost about $600 apiece Seven planes will have the sets David Little manager of the Radio corporation's aeronautics division, will supervise the installation

The Government radio weather reporting stations at La Crosse, Wis, and Chicago will be used by Northwest Airways in receiving weather reports It is planned to install transmitting sets at a later date

Mapping Mississippi Valley

MOLINE (ILL.)—Using the Moline Municipal Airport as a base the Hamilton-Maxwell Company of New York City, started a mosaic map survey of the Mississippi River from St Louis to Minneapolis Oct 1 The work is being done for the United States engineers by order of the Department of Commerce and will be used for flood control work. Two Fairchilds piloted by A. C Brown and A E. Hamer, of the Interstate Air Lines Inc., of Evansville, Ind., are being used

Operators Divided In Mail Rate Parley

Formula for Reduction Proves Difficult to Find

WASHINGTON (D C)—Conferences aiming toward rate reduction of air mail were begun Sept. 30 between Assistant Postmaster General W. Irving Glover and a group of contractors Postmaster General Walter F. Brown had indicated that on the basis of present rates the air mail would cost the Government $3 000,000 for the current fiscal year, and he therefore expressed his unwillingness to approve the extension of eight important contracts which expired during the week of Oct 1-7 without downward revision of rates.

The Postmaster General requested the eight operators concerned to devise a formula which could be used as a general basis for rate reduction A committee was formed consisting of Harris M Hanshue Western Air Express, Inc., L H Mueller, Varney Air Lines, Col L H Brittin, Northwest Airways, Inc; Col Paul Henderson, National Air Transport, Inc.; Phil Johnson, Boeing Air Transport, Inc; George B Schierberg, Robertson Aircraft Corporation; Gen John F O'Ryan, Colonial Air Transport, Inc; Hainer Henshaw, Continental Air Lines, Inc., Clifford Ball, Clifford Ball Inc

On Oct 7 the committee still found itself unable to reach an agreement, and at the present writing the Post Office Department has been asked for additional information on its future policy. In a general conference on Oct 3, the Postmaster General had expressed his feeling that the air transport industry needed no further help from his department, while Mrs Willebrandt, representing The Aviation Corporation of Delaware, contended that it was the intent of Congress that air mail operators should receive an indirect subsidy It was agreed however, that the time had not yet come to turn the question over to the Interstate Commerce Commission for adjustment on a cost plus basis, and the Postmaster General indicated that his department would not support a bill to that effect now pending before Congress

It has also been indicated that if the contractors fail to agree on a suitable formula for rate reduction some Government agency will undertake to do so

It is probable that if necessary present contracts will be extended for 30 days pending an adjustment, instead of being thrown open for new bids These contracts have run four years, and if extended will be for another six

Eastern Air Express Starts N. Y.-Miami Route

NEW YORK (N. Y.)—The first regular trip on the new Eastern Air Express, a subsidiary of the General Aero Corporation, bi-weekly service between this city and Miami was started from here Saturday, Oct 5. Three Bellanca six-place cabin planes, powered with new Whirlwind Nines will be used and it is expected that additional planes will be added to provide a daily service by Dec 1. In the meantime, planes will leave Holmes Airport in the borough of Queens, Tuesdays and Saturdays, and will leave Municipal Airport, Miami, Mondays and Thursdays. The fare is $145 from here to Palm Beach and $150 to Miami. A spur from Jacksonville to Tampa probably will be installed later.

Regular stops will be made at twelve points along the route. The complete schedule follows:

Lv **			Lv **	
6	a.m.	N. Y.*	7	p.m.
6 55	a.m.	Philadelphia	6 55	p.m.
7 55	a.m.	Baltimore	4 55	p.m.
8 10	a.m.	Washington	4 40	p.m.
9 20	a.m.	Richmond*	3 40	p.m.
10 40	a.m.	Raleigh	2 00	p.m.
12	Noon	Camden, S. C.*	12 45	p.m.
12 30	p.m.	Camden	12 15	p.m.
12 45	p.m.	Columbia	12 00	Noon
2	p.m.	Savannah	10 45	a.m.
4	p.m.	Jacksonville*	8 10	a.m.
4 15	p.m.	St. Augustine	8 35	a.m.
4 30	p.m.	Daytona	8 20	a.m.
6 10	p.m.	Palm Beach	6 40	a.m.
6 50	p.m.	Miami*	6	a.m.

**Read down going South. Read up going North.
*Fueling stations

To Ask Norfolk-Pittsburgh Bids

WASHINGTON (D. C.)—Bids are to be asked soon for operation of an air mail route over the new route linking Pittsburgh, Washington and Norfolk. The route has been surveyed by the Aeronautics Branch and is scheduled to be lighted and ready for use by April 1, 1930. The mail service probably would be opened about that time. This line will give Norfolk and Pittsburgh connections at Washington with planes operating north to New York and south to Miami. Connections for the West will be available through Cleveland as there is the Clifford Ball line between Pittsburgh and Cleveland at the present time.

Columbus Asks Bids on Servicing

COLUMBUS (OHIO)—The City Council has voted to ask the service director to advertise for bids for the concession of servicing planes at Port Columbus for a five-year period. The bidding is on how much the companies will allow the city per gallon of gasoline and what percentage of the price of lubricants the city will be allowed in consideration of the right to operate on the air field. Previous to the decision there had been much debate precipitated by an alternative plan by which the city would operate the servicing operations. It was contended the city had no money to install the necessary plant.

Airport Distributes Dividends

PINE BLUFF (ARK.)—Stockholders of the Arkansas Airport Company, operator of the Toney Field here, have received the third quarterly dividend of $1.75 per $100 share of stock. The 214-acre airport represents an investment of about $230,000 and the major revenue is derived from gasoline lease to the Standard Oil Company of Louisiana and the airport club house lease.

Richfield Beacon

TWENTY-THREE of the 34 beacons being installed in combination airport and roadside service stations along the Pacific Coast by the Richfield Oil Company have been completed. Work on the remaining eleven is under way. The project involves placing these stations, equipped with a 120 ft. steel tower surmounted by a Sperry 8,000,000 cp beacon, at intervals of between 50 and 100 mi. from the Mexican to the Canadian border. The stations are being built adjacent to airports wherever possible. In California they are of Spanish design and further north are English in style. The chain is costing about $10,000,000.

Brower Starts Omaha-Wichita Line

WICHITA (KAN.)—Wichita is the southern terminus of a new daily passenger line between this city and Omaha, opened Sept. 30 by the Brower Air Service Corporation of Lindsborg, Kan., H. F. Brower is president. Planes leave Wichita and Omaha each day at 10:30 a.m. and 3:30 p.m., making connections with cross country lines at both cities. Stops are made at Salina and Belleville, Kan. Curtiss Robin (Challenger) planes are used. The Brower interests own and operate flying schools at Lindsborg, Salina and Belleville.

Prepare Atlanta, Ga., Conference on Airports

ATLANTA (GA.) — The Southern Regional Airport Conference will be held at the Atlanta-Biltmore Monday, Oct. 14, under the auspices of the Airport Section, Aeronautical Chamber of Commerce. This will be the second such conference sponsored by the Airport Section, the first being the successful one held at Boston Sept. 23. A third is to be an All-Western Airport Conference at Los Angeles Nov. 7-8.

The speakers and their subjects at the morning session will be as follows: "The Planning and Development of a Municipal Airport," by George W. Forster, consulting engineer, Love-Sultan Inc., St. Louis, Mo.; "The Civic Club and Its Function in an Airport Planning Program," by Hub Hahn, president, Junior Chamber of Commerce, Birmingham, Ala.; "Management Methods of the Miami Airports," by Andrew H. Heermance, Director of Aviation, Miami, Fla.; "Uniform Service and Service Charges at Airports," by William H. Mallon, executive staff Aeronautical Chamber of Commerce, New York City. The afternoon session will be devoted to a round table question and answer forum.

Mason & Dixon Line May Start by Nov. 15

ATLANTA (GA.)—Direct air passenger service between Atlanta and Cincinnati and Detroit may be established by Nov. 15, it was learned recently, following a conference between F. W. Savage, of Mason & Dixon Airlines, Inc., and Beeler Blevins, of this city.

It is proposed to have two planes operating daily in both directions over the route. The Atlanta-Cincinnati hop will be made in about 3 hr. 30 min. while the entire trip from Atlanta to Detroit would be made in about 5 hr. 30 min. for the express schedule and 45 min. more on a schedule calling for local stops. It is planned to make stops at Knoxville, Middleboro and Lexington. Flamingo planes will be used.

Mail Shipment Totals 30 Sacks

NEW YORK (N. Y.)—Boeing and N.A.T. mail planes recently carried 30 sacks of securities valued at about $75,000,000 over the transcontinental mail route. The shipment was composed of certificates for about 15,000 eastern stockholders of the Transamerica Corporation. Leaving Oakland on the night transcontinental Sept. 29, the shipment arrived here Oct. 1.

Individual Hangars at Boston

BOSTON (MASS.)—Eight stalls to accommodate as many folding wing DH Moths have been erected at the rear of the Skyways hangar at the Municipal Airport.

Start Construction New Cleveland Port

CLEVELAND (OHIO)—Development of a 219-acre east side airport for Cleveland has been started by the Aviation Realty Company of which Yvon Mfrre, formerly distributor for a number of planes, is head. The new airport is located on SOM Center road and South Miles road, with entrances on both roads.

The airport is being developed primarily for the private flyer, although a section of it is being reserved for commercial enterprises. The operating organization will build a terminal hangar on the SOM Center side of the airport, which also will be used as a base to service planes.

The site of the new airport is the same one considered by the Goodyear-Zeppelin Corporation before they were given land in Akron. It is 13 mi. from the Public Square of Cleveland and lies directly on the transcontinental air route. Private flyers will be able to lease hangar sites and build their own hangars to take care of single planes.

To Study Radio Practices in Europe

WASHINGTON (D.C.)—A study of current European systems of aviation radio communication is to be undertaken by Gerald C. Gross, an engineer of the Federal Radio Commission, who is now on his way to the meeting of the International Consulting Technical Committee on Radio Communications at the Hague. His investigations will include the radio equipment in operation at Berlin, Paris and London.

Mr. Gross will give particular attention to: 1, present-day European aids to air navigation and frequencies and power used; 2, general communication frequencies and power used and normal distances covered; 3, use of direction-finding apparatus on board aircraft; 4, type of radiobeacon used on land; 5, use of high frequencies for aviation and normal carrying range.

Offer Air-Rail-Bus Co-operation

WICHITA (KAN.)—Through air-rail-bus co-operation just arranged, thirteen Kansas towns are offered excellent transportation connections with Central Air Lines, division of Universal system. The Arkansas Valley Interurban Railway Company and the Cardinal Stage Lines of Kansas have entered into an agreement with Central by which their schedules have been arranged so as to bring patrons to Wichita in time to catch Central planes to Kansas City, Topeka, Oklahoma City and Tulsa.

Anchor Fences For Curtiss Ports

CLEVELAND (OHIO)—Anchor Post Fence Company of this city announces it has a contract to build fences at 25 airports of the Curtiss Airports Corporation. These airports are located in all parts of the country.

Standard Opens New Airport

EL PASO (TEX.)—Standard Airlines has announced the completion of their new eastern terminal at this city which was opened officially and dedicated Oct. 6. The new field occupies 640 acres located 6 mi. northeast of the city. The entire area has been leveled and graded and put into shape for the landing and boundary lights. The hangar has a storage space of 9,000 sq. ft. The administration building includes offices, pilots' quarters and other conveniences.

Asks Airport Register Ruling

MILWAUKEE (WIS.)—A rule that no pilot shall be permitted to leave the county airport or have the privileges of the field upon arrival unless he registers himself, his plane and the owner, as well as the names and addresses of his passengers, will be sought as a county measure by Maj. Stanley E. Piasecki, port manager. It is said that the airport authorities have had trouble occasionally with fliers who refused to fully identify themselves. Major Piasecki asks that the measure be included in the new rules now being drafted by the county highway committee which has charge of the field.

Curtiss Officials See Airport Developments

NEW YORK (N. Y.)—Progress of Curtiss airport developments throughout the United States will be studied by a group of officials of Curtiss Airports Corporation who left this city in a special car Oct. 7. Stops will be made at Pittsburgh, St. Louis, Houston, Los Angeles, Alameda, San Francisco, San Mateo, Chicago, Milwaukee, and Cleveland. The trip is expected to take about three weeks.

Members of the party will include Walter S. Marvin, chairman of the board; Wm. F. Carey, president; David Visel, vice president in charge of business operations; B. R. Waite, chief engineer; Jack F. Tuyls, field engineer; H. W. Kroyer, treasurer; Col. G. W. Goethals, D. W. Knaggs of the publicity department of Curtiss Flying Service.

West Coast Moves to Oakland

SAN FRANCISCO (CALIF.)—West Coast Air Transport has transferred its operations from Mills Field, the municipal airport of this city, to the Oakland Airport. The change was made to afford better transfer facilities with the Los Angeles-bound planes of Western Air Express, according to officials of the company.

California Aviation Club Plans Big Port

LOS ANGELES (CALIF.)—The California Aviation Club, backed by Harold J. Barneson, has been organized to develop and operate a 222-acre field 2 mi. from Beverly Hills for private planes and a residential transport terminal. Mr. Barneson has invested $1,300,000 in the acreage which is to be developed into an eight way turf field.

With the proposed erection of a modernistic club house with full equipment for social and sport activities, the organization will be an aviation country club where members can buy, learn and fly planes according to a system resembling the British club plan with adequate hangar and service facilities. Geo. E. Read is the executive head of the organization, which is said to be capitalized at $2,000,000, and Robert Blair, president of the California Aircraft Operators Association will be technical executive, giving advice to members on the purchase, instruction and servicing of their private sport planes. In addition, the club plans to rent planes for cross country and instruction purposes.

W. A. E. Plans $100,000 Air Depot at Los Angeles

LOS ANGELES (CALIF.)—The new $100,000 air depot to be constructed here for Western Air Express will be four stories high, and will have facilities comparing favorably with those of a modern railroad terminal. In addition to the main waiting room, the first floor will have a restaurant, baggage room, ticket office and lounging room. The outside accommodations provide for the loading or unloading of five transport planes simultaneously.

Offices of the field executives will be on the second floor. The third floor will be devoted to offices and equipment for Herbert Hoover, Jr., director of radio, and his staff. The fourth floor, provided with glass walls, will be used by the chief dispatcher, and will have controls to direct arrival and departure of planes, as well as of all lighting equipment.

Boeing Postpones Passenger Line

SEATTLE (WASH.) — Boeing Air Transport has decided not to operate its "complete, regular passenger service" between San Francisco and Chicago, originally scheduled for this fall, until early next year, according to P. G. Johnson, president. Unavoidable delay in making the desired ground preparations are said to be responsible for this change in plans. However, the company intends to place the seven eighteen-passenger transports now available in operation between San Francisco and Chicago in November. The company already is using these big passenger machines on an overnight trip between San Francisco and Salt Lake City.

AIRPORT CONSTRUCTION PROJECTS

BOEING has contracted with Standard Oil Company of California for the surfacing of 4,000,000 sq.ft. of runways at United Airport Burbank, Calif The runways are 300 ft wide and about 3 500 ft long This contract does not include the asphalt and concrete surfacing to be installed at various points on the field

Contracts for the construction of the experimental runway at Lambert St Louis field, described last week have been let as follows: Two asphalt sections to Bangert Bros & Hays Ferguson Mo on a bid of $9 661, the concrete section to the Skrainka Construction Company of St Louis, on a bid of $10 195 The Myers Construction Company will handle the drainage work on bids of $9 284 and $7 485

Construction is expected to be completed at the end of this month on a 20x40 ft steel building at the Des Moines Iowa airport for the use of Yellow Cab Airways, Inc and Boeing Air Transport

The Waterbury, Conn airport being developed by private interests has been graded and a hangar is to be erected soon

Three civic clubs of Meriden Conn, have agreed to finance the installation of flood lights and other lighting equipment at the Meriden municipal airport The field is still in process of construction

Contracts have been let for the construction of Curtiss Flying Service hangar at Oklahoma City airport The hangar and field improvements involved will cost about $80 000

Nine Westinghouse chromolite landing lights are being installed at Cram Field Davenport Iowa

Work is started on the construction of the Three Rivers, Que airport The site is a mile long and 1 500 ft wide and it is expected to be in condition by early next summer

It is planned to dedicate Noyes Field, the Curtiss airport near Dallas Texas late this month Work on the field has been progressing and contract is about to be let for the construction of a 142x144 combination hangar and administration building to be completed by January 1.

San Benito Texas near the Mexican border, has recently issued $19 000 in bonds to be used to acquire a 120-acre airport site, development plans for which are already being prepared.

Von Hoffmann Aircraft Company has recently completed another hangar at Lambert-St Louis field This structure is of brick and steel and measures 100x120 ft. A 40x120 ft lean to is to be added some time in the future and will comprise a waiting room offices private offices, lounge retiring room and other accommodations for personnel Plans and specifications were prepared by B Russell Shaw Company Inc

Bellevue airport, a 340-acre tract near Omaha is being developed by Bellevue Airport Corporation a private $500 000 concern

The meteorological station at the Albany airport has been completed and instruments have been moved from the Ithaca office A second story has been added to the present administration building at the airport to handle the Weather Bureau equipment Matthew Peacock will be in charge

Improvements costing $5 000 have been made at the Jacksonville, Fla airport in anticipation of the arrival of the National Air Tour

Contract has been awarded for the construction of a new hangar at the Brokenstraw Airport, near Youngsville, Pa It will include a repair shop

The $11,000 flood and boundary lighting system for the Valley Boulevard, Los Angeles, airport of Western Air Express, has been completed. There are 24 boundary lights and the floodlight includes a special lens made in France under the specifications of Western Air Express

Definite steps toward removal of all city high-tension electric lines and other wires from the vicinity of Boeing Field Seattle, Wash, have been taken by the city utilities committee, which recently approved plans submitted by the superintendent of lighting for rerouting and rebuilding the Seattle-Tacoma transmission line and city feeder lines at an estimated cost of $101 756

The new $120 000 Curtiss Flying Service hangar, Toledo, Ohio was opened to the public Sunday Sept 22.

Between $10,000 and $15 000 is being spent in improvements at the Great Falls Mont municipal airport These improvements include a hangar and pilots' quarters Recently 61 additional acres were added to the airport area and three runways measuring 3,000, 4,500 and 6,000 ft. in length are now available

The plan of the New Orleans Airport Commission for an airport on Lake Pontchartrain has not been dropped it was announced recently The project is being held in abeyance pending court routine

About $4,000 has been authorized for improvements at the Sacramento, Cal, municipal airport so that Boeing mail planes may land there At present they use Mather Field 12 mi from the city

Residents of about 25 houses on the site to be developed for the Rhode Island State Airport near Providence have been notified to vacate and contracts for clearing the 350-acre site will be arranged soon.

More than 6 000 of the 10 000 piles required for the bulkhead at the Baltimore municipal airport are in place

National Parks Airways is building a 60x50 ft. hangar at the Pocatello Idaho airport The club house and dining room at Albuquerque airport is expected to be ready for use by Jan 1

Willard, N M is building an airport under the supervision of Albuquerque Airport, Inc

Appropriations totalling $62 500 have been made for improvements at Mills Field San Francisco municipal airport The appropriation is distributed as follows $8 900 for landing lights, $29 300 for pavements and $24 300 for drainage installation

Pounder's airport, a private landing field on the eastern edge of Portland Ore, is being developed by the Pounder Flying Service recently organized. The field has about 100 acres, has one runway 2 000 ft long running east and west and another 1,500 ft long is to be built

The Thompson Aeronautical Corporation's amphibion base on the Cleveland lake front is to be improved during the winter months New land has been acquired doubling the present frontage, and a new dock will be built.

Amend Aviation Radio Allocations

WASHINGTON (D C) — Amendments were announced Oct. 3 by the Federal Radio Commission to its plan for the allocation of aviation radio channels which became effective Sept 9 [See page 83, issue of Sept. 28] The changes make available on a temporary basis certain additional frequencies. The amendments are as follows

1 That the frequencies 12 180 and 12 210 kc designated by the President as reserved for Government experimental stations but available for assignment to commercial companies subject to recall by the Government upon six months notice be made available on such temporary basis for emergency aeronautical point-to-point communications on chains during daylight hours only provided, however applicants desiring the use of such frequencies can show by reason of distance to be worked that such frequencies are required

2 That the channels 3145 to 3 410 kc inclusive heretofore designated for aviation be made available to all chains for primary assignment to plane to ground and ground to plane communication and secondarily for emergency aeronautical point-to-point service

3 That paragraph six of the Sept 9 plan be modified with respect to the [illegible] chain to read as follows Western Air Express 3 870 aeronautical and aircraft Standard Air Lines 3,450 point-to-point aeronautical Mid Continent 6 350 [illegible] mainly for aircraft and aeronautical secondarily for point-to-point aeronautical West Coast Air Transport 3 01[illegible], 12 180 point to point aeronautical day only

4 That such existing licenses for aeronautical and aircraft stations as do not conform to the plan of Sept 9 and amendment thereto, be so modified as to conform to said plan

Dallas-Los Angeles Service Begins Nov. 1

DALLAS (TEX)—Daylight service between this city and Los Angeles will be inaugurated Nov 1 by Great Southern Airways Inc Schedules have not yet been made public but the 1,350 mi will be covered in about 10 hr 30 min according to the announcement by J B Miller, vice-president In operation the line will consist of two divisions from this city to El Paso and from El Paso to Los Angeles

Extension of the service to Atlanta Ga and from there to New York City is planned. It is expected that schedules will then be rearranged with part of the route flown at night to provide 24 hr service from New York to Los Angeles Great Southern Airways is a $2 500 000 corporation (Delaware) of which C M Hatch Los Angeles, is president

FOREIGN ACTIVITIES

Fritz Von Opel Flies 1¼ Mi. in Rocket Plane

FRANKFORT (GERMANY)—The first flight of a plane propelled by rockets was made here Sept 30 by Fritz Von Opel in a small machine designed by himself and Friedrich Sanders The flight lasted 75 sec and covered about 1¼ mi at an average altitude of about 50 ft., according to reports The wreck of the machine in landing, in which the pilot was uninjured, was said to be due to the fact that police would not allow it to be flown beyond the limits of the flying field, and a sharp turn in an unfavorable wind was consequently necessary

The "Sander Rak 1" is more like a glider than an ordinary plane It has a wing-spread of about 30 ft and is provided with steering fins behind the wings It has a very short fuselage similar to that of a glider in the rear of which the rockets are arranged In the first flight powder rockets developed by Sanders were used, but he is said to have developed a new liquid explosive for them which will be much more powerful It is noteworthy that the machine was started from a special carriage on a track only about 50 ft. long

Fritz Von Opel the pilot, is heir to the Opel automobile works which recently incorporated with General Motors Corporation He had previously demonstrated the use of rockets in an automobile which attained a speed of 120 m.p.h in 8 sec Both he and Sanders report themselves as satisfied with the first trial of the rockets in a plane and announce their intention of devoting themselves entirely to the development of rocket planes in the future

Chile Has Eleven Airports

SANTIAGO (CHILE)—Nine of the airports in Chile are available for commercial use, although they have not as yet been completely developed Large fields with hangars have been established at or near Copiapo, Penuco, Arica and El Salar de Carmen In addition military fields are maintained at El Bosque (near Santiago) and Iquique but private and commercial planes are forbidden their use except by special permission Emergency fields have been constructed near Ovalle Antofagasta, Talca and Rancagua which, it is expected, will eventually be developed into regular airports The navy maintains a seaplane base at Quinteros El Bosque is the only field which has been lighted as yet. The Helio system outlining the edges of the runway has been installed in preference to flood lighting

Von Opel takes off

Blériot Offers Racing Cup

PARIS (FRANCE)—Some years ago, there were speed contests for land machines such as those for the Gordon Bennett Cup, the Beaumont Cup, the Deutsch de la Meurthe Cup, and the Pulitzer Trophy, but they all were allowed to drop Now M Louis Blériot, the first man to cross the English Channel by plane, has announced the creation by him of a trophy for a pure speed contest between land planes The rules are not yet published, but it is understood that there is to be a limit fixed for the power, and a fairly low one at that.

Adjust Schedules For Mexico Service

LOS ANGELES (CALIF) — Standard Airlines Inc has announced a coalition with the Corporacion Aeronautica Transportes whereby Los Angeles and Mexico City will be brought within about 32 hr of each other The joint efforts of the two airline companies will shorten the traveling time between these two cities by more than 22 hr at a reduction in fare of almost $20 each way according to Jack Frye president of the Standard company The scheme is merely an agreement providing for an adjustment of schedules to furnish through service and no financial merger has been contemplated. Standard Airlines planes leave this city daily at 9 a.m and arrive in El Paso at 5 15 p.m, where through eastbound passengers can make direct trans continental connections Those destined for Mexico City board a plane the next morning at 6 a.m arriving in Mexico City at 5 15 p.m

Capt. Broad Leads In Zenith Cup Event

PARIS (FRANCE) — The Société du Carburateur Zenith, whose interest in air matters was proved for many years by the presentation of many aviation prizes, created some time ago a new cup for light planes The competition takes the form of an international challenge, open to machines of the first and second categories of the F.A.I (two-seaters weighing less than 400 kg empty) The winner must cover, between May 1 and Sept. 30, a given circuit at the highest commercial speed, with a minimum speed of 62 m.p.h. The competitor winning three times, in succession or not, becomes permanent holder of the Challenge Cup

The trophy was in competition for the first time this year, the circuit chosen was as follows Paris, Tours Bordeaux, Toulouse, Marseilles, Lyon Paris, a total of about 1,040 mi The pilot was compelled to land in each of the towns above named, the time elapsed during the stops not being deducted from the total time between departure and arrival back at Paris

On Aug 27, M Roeder, a German pilot who competed recently in the Challenge de Tourisme International covered the circuit at a speed of 83 m.p.h, on the same all-metal Junkers Junior low-wing monoplane with 85 hp Armstrong Siddeley Genet engine which he used for the Challenge de Tourisme He thus qualified for the Zenith Cup, becoming the first provisional holder The following day, M Finat, the well-known French pilot, had the misfortune to break an oil line at Toulouse

On Sept. 16, a fine performance was put up by Capt Broad flying his Coupe Moth with a boosted 85 hp Gipsy engine Leaving Orly at 7 30 a.m. he succeeded in circling the course in 9 hr 13 min., landing at Orly at 4 43 p.m.

This achievement is truly remarkable, to fly a distance of 1 040 mi at an average speed of 112 m.p.h, including six compulsory landings on different airports and refuelings is a mark hard to beat even with 300 to 400 hp powered planes [Other competitors entered and final reports have not been received yet—Ed]

Start Argentina Mail Service

MIAMI (FLA)—Air mail service to Buenos Aires via Pan American and Pan American-Grace Airways was inaugurated Oct 5 with the departure of the first plane carrying 654 lb of mail It is scheduled to arrive Oct 13 The first northbound mail leaves Buenos Aires Oct 12

Dutch Resume Line To East Indian Colonies

THE HAGUE (HOLLAND) — Weekly service between Holland and the Dutch East Indies started from Amsterdam Sept 12 and the first north-bound service was to have started from Batavia Oct. 8 This is a resumption of the service operated on a bi-monthly basis for some time and halted last spring when permission to use British aerodromes in Mesapotamia was withdrawn The plane leaving Amsterdam on the first flight carried 8,140 letters and other mail matter

This line is being operated by K.N.-L.M. (Royal Netherlands Indian Airways) and like its sister organization, the well-known K.L.M., is supported generously by the Dutch government. K.N.L.M. was organized comparatively recently to operate daily services between Batavia, Bandoeng and Samarang in the Dutch East Indies and its success on these lines has surpassed expectations Extensions to Medan, and Singapore and to points in Sumatra and Borneo are projected

Tri-engined Fokker F. VII planes, powered by Titans, are used on the Holland-Dutch East Indies service on which passengers will be carried only if postal authorities do not claim all room reserved for mails. Passenger fares to Batavia will be about $1,000 not including board and lodging at stops All planes will have a crew of three, including two pilots. All of these are military trained and have been quite a long time in the service of K.L.M. with the exception of Doctor Jongbloed, a licensed flying officer of the Dutch Army, who will be employed on the Amsterdam-Batavia route to simultaneously study the influence of tropical and other atmospheric conditions on the crew

The initiatory route will include Vienna, Sofia, Aleppo, Bagdad Karachi Allahabad, Calcutta, Akyab Rangoon Bangkok, Singora and Medan, (Deli) At 21 aerodromes auxiliary material for the planes has been stored as well as such spare parts as propellers, shafts, wheels, etc., at Bagdad, Karachi and Bangkok. Consequently the planes this time need not carry big spare parts and thus save 225 lb of load which can now be used for paying business

It may be mentioned that on each flight during last winter the mail load averaged 650 lb. at a stamp value ranging from $10 to $12 per lb and also that the flight performed in 1927 by a Fokker airliner of K.L.M. with Van Lear Black and his valet as first passengers materially contributed to the enthusiastic support of the service.

Study Air Laws at Warsaw

WARSAW (POLAND)—Delegates from about 50 countries are expected to attend the second international diplomatic conference on aeronautical law being held here Oct 7-17 Unification of air laws throughout the world is one of the main purposes of the meeting

Waco Wins Race in Australia

BRISBANE (AUSTRALIA)—The annual Aerial Derby held here by the Queensland Section of the Australian Aero Club resulted in a win by a Waco, powered with a Wright J5 Whirlwind engine. The course, three times around a closed circuit of 71 mi, was covered by the machine at an average speed of 104 mph A total of seventeen machines competed including a Curtiss Robin, De Haviland Moths and Westland monoplanes.

New French Light Plane Makes Records

PARIS (FRANCE) — M. Mauboussin, a jeweler who had always taken keen interest in aviation, decided some time ago to build a little machine to verify some of his particular theories about plane design He had it constructed by M. Peyret, a veteran in aeronautics, having been one of the first assistants of Louis Blériot about 20 yrs. ago. The machine is a single-seater cabin monoplane, with wing resting directly on top of the body. The construction is all-wood, including covering It recently established four world records for light planes

The wing is of very high aspect ratio (10), with small moment coefficient and important thickness, allowing of a remarkably low weight As the center of pressure is practically stationary, the tail length is greatly reduced without in any way impairing stability nor maneuverability. The tail surfaces have aspect ratios much greater than usual

The ailerons extending the whole span, are actuated by differential control and function simultaneously for landing, decreasing the landing speed by some 20 per cent The whole machine is remarkably clean and its actual L/D ratio is exceptionally high

The general characteristics are as follows: Span 32 ft 9.7 in.; length, 14 ft 5¾ in.; height, 6 ft 7 in.; wing area 107.64 sq ft., weight empty, 429.9 lb., useful load, 299.8, total weight, 729.7 lb. The engine is an A.B.C. Scorpion II, developing 34 hp at 2,300 r.p.m.; direct drive Levasseur propeller The first officially recorded performances are as follows (they have greatly been improved since by changing the airscrew): gave a top speed of 89.6 m.p.h., climb to 13,120 ft. in 46 min. and service ceiling of 18,400 ft

Guatemala Interested in Airline

GUATEMALA CITY (GUATEMALA) —The air mail between Mexico City and Guatemala City recently begun by Mexican Aviation Company has aroused much enthusiasm along the line of the new route. The six daily newspapers of the Guatemala capital—El Imparcial, Nuestro Diario, El Tiempo El Diario de Centroamerica Excelsior, and El Diara de Guatemala are giving much space to aviation President Lozaro Chacon and his cabinet officers are encouraging flying throughout the republic

Ford Plane Completes One Tour, Starts Another

CROYDON (ENGLAND)—Only a few days after completing a 7,500 mi tour of northern Europe, the Wasp powered Ford plane, which was brought over here for the Olympia exhibit, started on another long trip through Central Europe to Constantinople. It was demonstrated here Sept. 10 and 11 to various interested members of the British industry, and government officials including Sir Sefton Brancker, Director of Civil Aviation, who flew it as co-pilot with Mr Manning of the Ford company The trip to Constantinople began Sept 14, with stops scheduled at Friedrichshafen and several other points along the route.

The first tour was started shortly after the Olympia Show, and began with a flight to Paris, where demonstrations were made for three days After a short stop at Cologne, the plane proceeded to Berlin where it remained for a week It was then flown to Moscow by way of Danzig and Riga. In Moscow, the Ford representatives were shown the government aircraft factories Stops on the return journey to here were Smolensk, Riga, Warsaw, Posen Travemunde Copenhagen, Malmo Amsterdam, Rotterdam, Lympne and Hamble.

Foreign News Briefs

A world distance record over a closed course for light planes weighing not less than 880 lb has been claimed by Pilot Edzard of Germany and the claim now is before the F.A.I. for homologation Edzard used a Focke-Wulf two-seater and covered about 1,000 mi

The Junkers company is reported building a small, two-seater all-metal plane powered with a 15 hp engine.

Press reports state that the Dornier company is planning to sponsor an attempt of the Do. X to fly the Atlantic this winter.

On Jan 1, 1929, there were 43 licensed planes in Switzerland, and on July 1 there were 55. Of the additional planes, five were A. C. "Gentlemen" (Swiss), three Klemm Daimlers, three Fokkers, two Dewoitines (Swiss), two Hoffners, one Moth, one Breda, and one Raab-Katzenstein.

Using a Fultograph radio picture receiving apparatus, the pilot of a Junkers plane recently successfully received weather charts in picture form from a ground station. These important tests are being continued and it is expected they will result in adoption of the scheme on all German transport planes

About 100 have joined the first Australian Gliding Club recently organized at Geelong, Australia

It is understood that France expects to attempt a new speed record on one of the machines developed for the Schneider contest and that Italy is building a new Macchi with Isotta Fraschini engine for the same purpose

THE BUYER'S LOG BOOK

Improved Paulin Altimeter

DESIGNED especially for use with aircraft, a new Paulin altimeter and level flight indicator has been placed on the market by the American Paulin System, Inc., a subsidiary of the General Instrument Corporation 1220 Maple Ave., Los Angeles, Calif This instrument is a refinement of the original Paulin altimeter which was described in detail in the Feb 16, 1929, issue of AVIATION.

Photograph of the Paulin Altimeter

The Paulin level flight and altitude indicator is a self-contained instrument weighing 48 oz., and can be mounted directly to the instrument board by means of four screws The face measures 3 in x 6 in and the case is 6 in deep Mounting the new altimeter is a very simple operation

The rectangular dial of the Paulin instruments has a balance indicator near the top of the dial altitude scales reading to 25 ft over a range of 20,000 ft., just below the balance mark, and a setting knob near the bottom of the dial. A barometric scale is provided on the setting knob so that the instrument may be set for any ground altitude or barometric pressure If the ground altitude is known the instrument can be used as a barometer.

In flight the precise altitude may be determined at any time by adjusting the knob until the balance marks coincide, thereupon reading the altitude scale As a level flight indicator the altitude at which it is desired to fly is first set on the scale and the plane is then maneuvered until the balance marks coincide The balance indicator moves with the plane, climbing as the plane goes over the set level, or dropping as the plane falls beneath the level, so that it is possible to maintain flight within 25 ft of any desired level The Paulin altimeter is manually operated, instead of automatic reading ft is considered especially valuable for map making and aerial survey work, as well as for use on transport planes which operate in darkness or obscure weather

Rajah Terminal Improved

IMPROVEMENT of the Lock Clip Terminal manufactured by the Rajah Spark Plug Company is announced A bakahte ferrule is now being furnished with the terminal This simplifies testing, and improves electrical contact as well as appearance of the terminal.

Milburn Acetylene Generator

DRAWN seamless steel is used throughout in the body construction of the portable acetylene generator recently placed on the market by the Alexander Milburn Company, Baltimore, Md This generator is light in weight and has been tested thoroughly by the Underwriters' laboratories It is available in three sizes, the 35 lb 70 lb and 100 lb capacities

The generator is simple, has no clocks or motors and few moving parts The carbide hopper feed control and head are assembled in one unit which can be detached from the seamless steel body by the removal of a few bolts The carbide feed is controlled by a single valve which responds to high or low pressure and automatically stops if the pressure is at zero, or if the filler plug is open or the generator is not properly closed


Milburn Generator

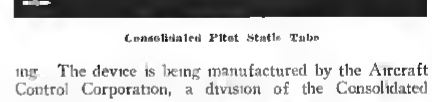
The control and operation of the generator is so simple that the carbide feed is uniform and a complete consumption of the entire charge is assured

The machine is equipped with well developed blow off valves, pressure control, safety gas purifier and strainer The component parts of the machine are made with oversize outlets welded into the generator body

The body has a protective coating inside and out Handles of ample size welded on to the body, provide for convenient transportation The cost of generating acetylene gas in the new Milburn generator is approximately 1½ cents per cubic foot of gas

Monoplane Pitot Static Tube

ANNOUNCEMENT has been made by the Consolidated Instrument Company of America, Inc., 305 East 47th Street, New York, of the development of a new type of pitot static tube for monoplane wing mounting The device is being manufactured by the Aircraft Control Corporation, a division of the Consolidated company


Consolidated Pitot Static Tube

The new pitot static tube is 42 in. in length and has a diameter of one inch It is rigidly constructed and is similar in operation to the standard tube of this type manufactured by the company It is of course considerably larger that the standard instrument

WHAT OUR *Readers* SAY

Intelligent Air Mail Use

To the Editor:

Thank you for proof of editorial under date of Aug. 17 from AVIATION I want to tell you that the Post Office Department has been trying to put across just what you drew out in the editorial I had already written an answer to the story in the *Washington Post*.

We are trying to get people away from the "Mail all your letters Air Mail" idea, and teach them that not all of the thousands of cities in the United States are connected by direct Air Mail lines. You will find a great many of our postmasters now who are preaching the gospel of Air Mail, using as a text 'Use the Air Mail with Intelligence" but, of course that is not always understood correctly.

There are any number of post offices which now issue a monthly bulletin with a great number of cities showing how Air Mail can be intelligently used to save time and I am glad to say also that there are several operating companies who are adopting this method of advertising the Air Mail and finding that it brings them worth-while results.

W. Irving Glover,
Second Asst. Postmaster General.

[The editorial referred to by Mr. Glover dealt with the air mail tests conducted by the *Washington Post* and with the necessity of spreading information on where and when the air mail runs so that it may be used to the best advantage with mailing times properly adjusted to air mail schedules.—Ed.]

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Regarding Altitude and Alcohol

To the Editor:

I have just read with distinct interest your article on "Alcohol and Altitude." I believe that the forcible calling of this to the attention of the industry is a courageous step and one which can do a great deal of good.

I find, from my frequent contact with substantial operating companies that with the tremendous press of work which has come upon aviation in the last year, the majority of present transport pilots, among whom are numbered some of the "best fellows" in the industry in the "olden days" have found it essential to give up the use of alcohol. This is part of the whole application of common sense toward increased efficiency in all air operations—and no doubt in our own organization partly responsible for a peak record such as we were able to establish this last August in carrying 20,117 passengers without a single fatality. I am certain that the only men who will remain in the high positions in this industry today are those whose judgment will guide them so accurately that they will do nothing which might even remotely affect the security of air transportation. I consider your editorial very timely and one which is bound to do good.

C. S. Jones,
President, Curtiss Flying Service.

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Dents and Strip Steel

To the Editor:

Your issue of July 20, which has been delayed in transmission and has only just reached me contains an editorial reference to the British type of steel construction and incidentally, to the articles on this subject by myself which you have been good enough to publish.

I should like to express my thanks for the general tone of your reference to this subject, and particularly for your recognition of the fact that this British development deserves the serious consideration of the American aircraft industry.

There is one point however, on which I feel that I must disagree. You state that "The special weakness of strip steel as a spar material is its extreme sensitiveness to local damage. A tiny dent may be responsible for secondary failure at far below the intended strength."

There is no question as to the serious effect on the strength of spars or other members of this generic type of local damage of the nature of dents. The idea that such dents can easily be produced in thin walled steel members such as are in question is one that occurs to almost everybody who is not familiar with this type of construction.

In fact it is amazingly difficult to produce dents or similar local deformations in the modern British type of steel spar. In some of the earlier examples, made from steel of relatively low elastic limit, and having easily damaged free edges or unsupported flat areas of appreciable extent this liability to local damage did occur.

It has to be remembered that the difference in the modulus of elasticity of various grades of steel is very small and that to all intents the difference between a mild steel with an elastic limit of 20 tons/sq. in. and a hardened and tempered alloy steel with a limit of 60 tons is that the latter has to be deflected three times as much as the former before permanent deformation occurs. The amount of energy required to produce such deformation is proportional to the range of elastic deflection which must precede the damage. The form of the spars used is such as very effectively to resist such local bending, and the material will stand up to a very considerable degree of such deformation before reaching its elastic limit.

In practice it is found that treatment which would seriously damage light alloy or wooden spars has no effect on properly designed steel spars, and it is only by brutal ill usage that dents can be produced.

At the recent Olympia Aero Show I found many foreign visitors raised this question of the apparent susceptibility of steel spars to local damage. I found the most effective answer to be to hand the unbeliever a three foot length of a spar of the size used in the wings of a 10,000 lb. biplane and invite him to try and dent the free end of the web at one end by beating the spar on the concrete floor. The web could be deformed in this way, but only just, and the result was rather a smooth bend extending back for some way than a sharp kink.

W. H. Sayers,
Norwich, England.

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America and the Schneider Races

To the Editor:

The final report on the results of the Schneider Cup Race in your issue of September 14th gives me a renewed desire to express my regret at the absence of the United States from this famous international event.

It is granted, of course, that there are no cash dividends to be secured by participating in the Schneider Cup Race. There is even some question that the technical data secured justify the large investment.

Is there not, however, sufficient justification for our entering a race of this kind, simply to support the prestige of the United States and to justify the confidence of its aeronautical industry. We pride ourselves upon the technical ability and the wealth of the aviation group here, the United States as a whole prides itself upon its enthusiasm for sporting competition.

May we not hope that there will be a concerted effort on the part of the aeronautical industry in this country towards constructing several highly developed entries for the next Schneider Cup Race?

Andre A. Priester,
New York City.

A Correction

To the Editor:

In your issue of September 21st you refer to the use of a Reed propeller on the British winner of the Schneider Trophy for 1929, and you say that the propeller was designed by me. I should like to correct this and to say that the design was made by Mr. A. P. Ralh, propeller engineer and designer for the Fairey Aviation Co., Ltd., who made the propeller as my licensee.

Mr. Ralli determined the diameter, blade plan, profiles and pitch angles, conforming, of course, to my general type of blade, and the center was that of Type R.

Ralli also designed the Fairey-Reed propeller which was used by the winner of the Schneider Trophy at Venice in 1927, and he was awarded for his achievement a silver medal by the Royal Aeronautical Society in September, 1927.

S. Albert Reed,
113 E. 55th St.,
New York City.

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Central America and Aviation

To the Editor:

Day before yesterday up above the clouds in a big trimotored Ford, over Guatemala City headed down this way, I noticed the August 10th and 17th copies of AVIATION.

But neither my daughter nor Mr. Bennett, who is the Guatemala manager of the United Fruit Company, nor myself were in any mood to read about aviation, we were too excited experiencing it. We were learning that it is difficult to appreciate aviation properly unless you are down in countries like this, where all the usual forms of transportation leaves so much to be desired either because of general backwardness or of too many mountains, or both.

For instance: Before we got our invitation to try out the plane, we had expected to take a train at 7 a.m., arrive here, after suffering a good deal of heat and dust at 3.30 p.m. If by any chance we had wished to return to Guatemala City it would have meant waiting until the following day and then another nine hours back to the city again. But with the plane, we took off at 6.25, were down here at 7.55, circled around for some moments to figure whether a landing was safe here or at a near by town, decided against it and were back at the city up in the mountains and out on the ground again by *9.15!* Just under three hundred miles in less than three hours, as against the usual two days. An even that says nothing about the beauty and wildness of the scenery and the thrill of going up to about 7,500 feet above sea level to make sure of clearing the mountains.

Beyond all question, the biggest thing happening down here in Central America, economically, politically and socially—is *aviation*. It is undoubtedly going to do more than diplomacy and business have been able to do to date toward bringing these countries into fellowship with the rest of the world — all to a degree which can properly be appreciated only by those who live in countries possessing practically no first-rate truck roads whatsoever! Instead of taking between seven and fourteen days for mail to get down from New York, it will soon take about forty hours!

Whiting Williams,
Virginia, Guatemala.

[Mr. Williams will be known to many of our readers as the writer of standard texts on labor conditions and personnel management. His aeronautical contacts are, as his letter makes apparent, those of an enthusiastic patron of air transport.—Ed.]

Editorial Comment
FROM THE DAILY PRESS

Investments in Aviation

The stirring news that various aircraft companies have reached such a stage that dividends on stocks will soon be voted is taken as a matter of course by those who have followed the almost miraculous development of commercial flying following the World War.

Never before has there been an industry that has made such mighty strides in so short a time. The expression "air minded" has almost lost its meaning, since all minds are busy with the air, even if not all have gone practically in for aviation.

That fortunes will be made may be taken for granted. The assurance is such that the usual timidity of capital has disappeared and there are millions to back lines and factories.

This does not mean, necessarily, that one has but to buy a few shares in an aircraft company to receive vast wealth. Some of the companies will never pay. This is true of all businesses. There must be the same caution shown about making investments in aircraft concerns as anything else.

Many of the original investors in railroads lost all they put in. The same is true as to some who experimented in making self-propelled vehicles. Not all who dreamed of riches from manufacture of automobiles were successful.

One special reason for care is the fact that in a swiftly developing industry, based on invention the new companies, having the best devices, have an advantage over the older ones, in that they do not have to scrap factories. Keeping abreast invention was one of the greatest trials of the telephone business. It is a trial of the radio business. The last word in scientific improvement has not been said nor will it be for years to come.

There is money in aircraft but the business is not free from the hazards that have attended all other rapidly developing industries. Investors must be prudent and must be prepared to meet such competition as is certain to come.

Kansas City Journal-Post.

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Airports and Progress

The argument against aviation sounds very much like those advanced in 1870 when Dr. J. N. Converse tried to awaken local interest in a railroad which finally, but only after almost superhuman efforts, meandered its way toward Lincoln to connect what were then two important Nebraska towns, and still are. No, we do not need an airport. We do not need anything except three meals a day, a place to sleep and a gunny-sack to play substitute for a pair of pants. And if a progressive Nebraska Citvan listens to such curbstone arguments on civic affairs as are occasionally heard, we won't even need an addition to a cemetery. We can permit our dead to walk the streets as they do in some communities.

Hyde Sweet,
Nebraska City News-Press.

• • •

Speaking of Progress

Speaking of progress in aviation, the regular passenger airlines of Oklahoma have carried 10,000 people during the last 12 months with not one killed or injured.

That is a performance that means something to the man in the street, something he can understand, something which dispels his doubt and skepticism.

What the public wants to know is not how far a particular airplane can travel, with or without refueling, but how definitely the element of danger has been reduced in ordinary, every-day travel.

M. E. Tracy,
Scripps-Howard Newspapers.

SIDE SLIPS

By
Robert R. Osborn

APPARENTLY INSPIRED by the suggestion in this space a few weeks ago that pilots at the National Air Races be put through a navigability test, 'Anonymous' suggests the following figure of merit for the pilots of the Ford Tour.

$$\frac{\text{Number of thirsty pilots}}{\text{Displacement (Full load)}} \times \frac{\text{Number of stop-overs}}{\text{Drinks available}} = \text{Figure of merit}$$

. . .

That great fall in the prices of all aeronautical stocks you noticed recently was caused by the announcement that the town of Rye, New York, might have to stop all flying—possibly in the whole eastern section of the United States, so far as we know. We quote the mayor, as reported in the New York papers: "For some time people thought it was scientific and it would be poor sportsmanship to object to flying, but now there seems to be a wave of disapproval throughout the country."

We've noticed our unpopularity too and we're awfully, awfully hurt about it. We'll bet the attendance at the National Air Races has fallen off to 200,000 people a day this year, compared to 100,000 a day last year. We suppose the only cure will be the old Listerine bottle.

. . .

Mr. W. J. D. of Pittsburgh sends in a clipping from a local paper stating: "It was not long before its departure that the Graf Zeppelin was reported far at sea."

This is quite the opposite of the policy of caution adopted by 'the world's most conservative newspaper correspondent" as discovered by a New York newspaper which received a message from him from one of the mid-Atlantic islands. "Large dirigible passing overhead, believed to be the Graf Zeppelin."

. . .

One frequently hears the comment that "the accomplishments of the military and racing planes of today become the commonplaces of civil aviation tomorrow" and another news dispatch just came in the office that proves the truth of this assertion. A short time ago the Navy pilots at the National Air Races were performing with their ships tied together and now we read: "Montreal, Que.—For the first time since the daily air service between Montreal and New York was inaugurated on October 1, 1928, a second section was necessary to accommodate passengers who were unable to secure reservations on the regular mail plane. The planes left within a few minutes of each other, *carrying nine persons between them.*"

. . .

Apparently our readers (it seems there are two or three) think we aren't running enough campaigns and societies, as there is a continual demand that we start other societies or campaigns to educate newsreel photographers or muffle pilots who always complain of head winds. M.N.P. of Wright Field, Dayton, Ohio, wants something done about affectionate airplanes that wag their tails and sends in the clipping that called his attention to this amazing condition. "Some witnesses claimed that his plane was laboring to attain altitude and was handicapped by a pronounced wiggle in its fuselage."

We agree with M.N.P. that in the air is no place for affection of any sort and can relate an embarrassing incident that happened to a friend of ours from the same cause. He had taken off in a tri-motored plane for a cross country flight when the ship started waving its tail around in a nice sort of way. Not caring for such playing around when there was serious business to be done our friend turned back to the airport and landed. On taxiing up to the hangar he discovered that the complete rear end of the fuselage had been left back where he first landed and was so disturbed by the incident that it took half of a pack of Murads to overcome his embarrassment.

. . .

Mr. L. C. of Utica, N. Y., reports as follows, "The second exposition of Progress here was marked by the appearance of a Gypsy Moth plane flown here for the occasion by Joseph Livermore, chief pilot of the Syracuse branch of the Curtiss company. Livermore was sealed in the cockpit of the plane in Clinton Square, Syracuse, by Mayor Charles G. Hanna of that city and then was taken to Syracuse airport. Landing at Utica Municipal airport the plane was taken by truck to the exposition grounds in Broad Street, where the seals were removed by Mayor Fred J. Rath."

The pilot, we presume, has been taken to the Washington office of the N.A.A. where he is being calibrated.

. . .

Roosevelt Field Flying School is giving a flying course in a series of radio talks, which accounts for the story about a mysterious airplane seen hovering over the Long Island fields recently. The pilot of this ship is reported to have dropped a message saying that he was a student of the radio course and had taken off at the beginning of the series. Because of static interference, apparently, he missed the talk on landings and if the school didn't mind he'd like a repeat on that particular lecture as he had an important dinner engagement in three days and would like to get down.

. . .

"B" of Hollywood, Cal., writes in to inquire about the authenticity of an altitude record he discovered in a San Francisco paper. "We were up 75,000 feet when we ran into a wind and lightning storm."

We have inquired about among our friends and are sure that the pilot quoted in this dispatch must be wrong as all of them said they had never experienced a wind and lightning storm at 75,000 feet.

. . .

Mr. W. J. W. of Detroit Municipal Airport sends in a bit of a mystery to be solved by our Sherlock Holmes and Dr. Watson Department. In describing one of the airplanes submitted to the Guggenheim Safe Aircraft Competition one paper says:

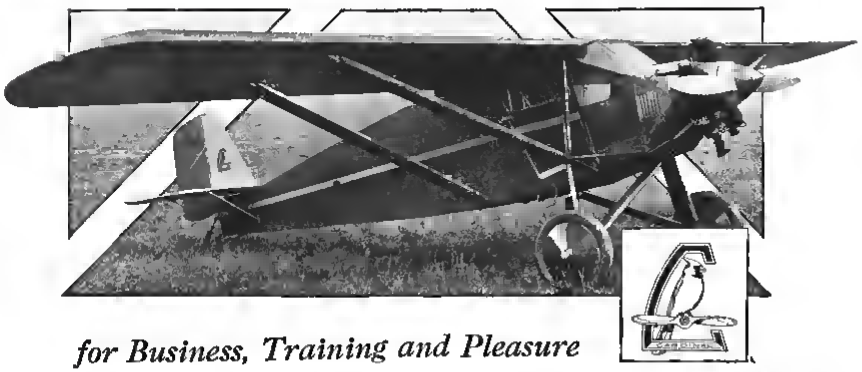
"An airplane whose pilot may increase or decrease the *life* of its wings by changing their curvature in flight, has been undergoing tests."

and another says:

"Secret tests are being conducted here with a new cabin monoplane known as Alfaro, built by a Cleveland designer. A feature of the ship's somewhat radical design is that the pilot can increase or decrease the *hist* of the wings by changing the curvature in them."

Our detective force has not yet turned in a complete report but their messages back to headquarters indicate they are working on the theory that the correct word is "luft" derived from the German word "Luft Hansa" meaning "to curve a wing."

ST. LOUIS CARDINAL



for Business, Training and Pleasure

KEEPING pace with the demand for power, speed and performance, the Cardinal is now offered in a Senior model with 90 hp. engine, in addition to the Standard Cardinal with 65 hp engine. Both engines are LeBlond, radial type.

Aside from the engines, both Senior and Standard Cardinals are identical. Fuselage is of chrome molybdenum, wing is of spruce spars, brakes and shock absorbers are standard equipment. The cabin in weather tight and roomy, fitted with non-shatterable glass. Double rudder stirrups and detachable dual control on the stick admits conversion of the business or sport plane *into a training ship in a twinkling.*

Forty odd years of experience in developing and manufacturing transportation equipment are behind the Cardinal. The St. Louis Car Company, parent organization of the St. Louis Aircraft Corporation, manufactured aircraft during the pioneer days, made planes for the Government during the World War, and today the Cardinal offers the best of designing knowledge and quality workmanship.

Those interested in the resale of aircraft are invited to convince themselves of the superiority of the Cardinal by a thorough inspection and should look into the value of the Cardinal franchise, which before long will be as valuable as the best automobile franchises are today.

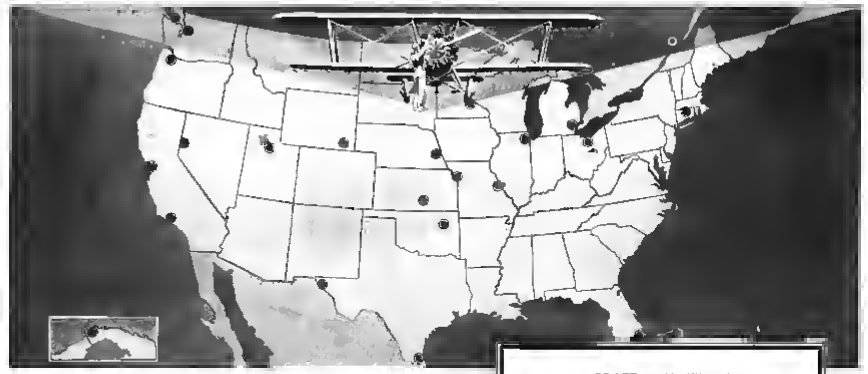
Performance and Specifications
Approved U. S. Department of Commerce

	65 H.P.	90 H.P.
High Speed	100 M.P.H.	120 M.P.H.
Cruising Speed	85 M.P.H.	105 M.P.H.
Landing Speed	35 M.P.H.	40 M.P.H.
Cruising Range	500 Miles	350 Miles
Rate of Climb	800 Ft. Per Min.	1000 Ft. Per Min.
Engine	LeBlond	LeBlond
Gasoline Capacity	25 Gal.	28 Gal.
Oil Capacity	3 Gal.	3 Gal.
Landing Gear	Split Type	Split Type
Shock Absorbers	Oil dreulic	Oil-draulic
Stabilizers	Adjustable	Adjustable
Tail Skid	Rubber Disc	Rubber Disc
Tires	26x4 Clincher	26x4 Clincher
Brakes	Pedals	Pedals
Instruments	Standard	Standard
Weight empty	900 Lbs.	940 Lbs.
Disposal Load	550 Lbs.	550 Lbs.
Normal gross weight loaded	1450 Lbs.	1490 Lbs.
Price—Flyaway St. Louis	$2950.00	$3450.00

Write for complete sales information, or better still, ask for demonstration.

ST. LOUIS AIRCRAFT CORPORATION
Subsidiary of the St. Louis Car Company
ST. LOUIS, MO.

Distributors' and dealers' franchises available. Write us if interested.
Flying schools interested, write or wire for demonstration.



"Wasp" and "Hornet" service nation wide

FROM coast to coast . . . Canada to the Canal Zone . . . in strategic centers of the nation . . . The Pratt & Whitney Aircraft Company has established twenty-four authorized service and ports stations to further insure the internationally famous dependability of "WASP" and "HORNET" engines.

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Thus, when a "WASP" or "HORNET" owner has his engine serviced or overhauled he is assured of the same painstaking care and high quality workmanship that is used in the manufacture of the engines at the factory.

At each station a complete stock of parts is carried. For quick delivery our dealer can ship your order by air to points along his route. All Pratt & Whitney engine owners should fly to the nearest service and parts dealer for periodic inspection and overhaul.

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Kansas City, Mo.	Universal Aviation Corporation
Wichita, Kansas	Universal Aviation Corporation
Brownsville, Texas	Pan American Airways, Inc.
Cristobal, Canal Zone	Pan American Airways, Inc.
Los Angeles, Calif.	Meddux Air Lines, Inc.
San Francisco, Calif.	Meddux Air Lines, Inc.
Tulsa, Okla.	Southwest Air Fast Express, Inc.
Omaha, Neb.	Boeing Air Transport, Inc.
Cheyenne, Wyoming	Boeing Air Transport, Inc.
Salt Lake City, Utah	Boeing Air Transport, Inc.
Reno, Nevada	Boeing Air Transport, Inc.
Oakland, Calif.	Boeing Air Transport, Inc.
Portland, Oregon	Pacific Air Transport, Inc.
Seattle, Wash.	Pacific Air Transport, Inc.
Los Angeles, Calif.	Aero Corp. of California, Inc.
El Paso, Texas	Aero Corp. of California, Inc.
Detroit, Mich.	Stout Air Services, Inc.
Cleveland, Ohio	Stout Air Services, Inc.
St. Paul, Minn.	Northwest Airways, Inc.
Miami, Florida	Pan American Airways, Inc.
Hartford, Conn.	The Pratt & Whitney Aircraft Co.
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Manufactured in Canada by The Canadian Pratt & Whitney Aircraft Co., Ltd., Longueuil, Quebec; in Continental Europe by The Bavarian Motor Works, Munich.

Wasp & Hornet ENGINES

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Truscon furnishes the various steel products required in any type of hangar construction. Truscon Steel Hangar Doors are of distinctive design and construction to insure durability, easy operation and long service. They open the full width and are available in all sizes of Straight or Curved Track types.

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AVIATION INSURANCE PROTECTION

B & B SERVICE

facts about B. & B. Service

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FIRST to supply, in 1922, comprehensive aviation insurance under an all-American combination policy form, than which no broader form exists today.

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ALONE in having developed a world-wide organization whereby American exporters of aircraft may secure adequate insurance and in addition, foreign local engineering and advisory service.

ALONE in having paid more aviation claims than all other aviation insurance organizations,

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MONO AIRCRAFT Planes won more race prizes than any other make at the Cleveland National Air Races

Miss Phoebe Fairgrave Omlie with her prize-winning Monocoupe

Verne Roberts with his prize-winning Monocoupe "Little Sweetheart"

The Mono Aircraft career is conspicuous for its numerous victories. And *now* again—the inherent flying qualifications of Mono Aircraft planes have been proven beyond a doubt.

The first woman's National Air Derby was won by a *Monocoupe* piloted by Phoabe Fairgrave Omlie. Not only did she receive the Standard Steel" trophy for first place in the light plane division but also the "Aerol Trophy" which was awarded for the *most efficient performance of all planes* in the flight. The course was from Santa Monica, Cal. to Cleveland, Ohio, a distance of 2723 miles, in 25 hours, 10 minutes and 36.5 seconds time elapsed. Miss Omlie also won the Women's 50 mile race.

The 50 mile closed course event for motors of 510 cubic inch displacement was won by Verne Roberts in his *Monocoupe* "Little Sweetheart". Second, fourth and fifth places were also won by *Monocoupes* in this race, conclusively proving the consistent superiority of Mono Aircraft. Competing against planes powered with engines of much greater horsepower, Verne Roberts' *Monocoupe* took second place and Stub Quinby's third in the 720 cubic inch class, and Verne Roberts placed third in the 400 cubic inch class.

On the flight from Philadelphia to Cleveland a *Monocoach* piloted by Ike Stewart took second place, as did the *Monosport* piloted by Leslie Bowman on the flight from Miami Beach to Cleveland.

Mono Aircraft planes are designed and engineered especially for the private flyer. Their popularity and approval in aeronautical circles is due to the superior advantages they offer in performance, safety, ease of control, comfort, speed and economy. They represent the highest performance and outstanding values in aviation today.

MONO AIRCRAFT CORP.
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"We know a Lawyer who has made 133⅓ per cent *on* his investment *during the first year of this interesting business"*

American Eagles are built by fliers for fliers. E. E. Porterfield, Jr., president of the American Eagle Aircraft Corp., as a pilot makes rigid demands of an airplane and these are naturally incorporated in American Eagles.

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American Eagles have long been known not only for their stability, airworthiness, safety and dependability, but also for their ability to make money for their owners. The American Eagle franchise offers you a new, yet proved plan of merchandising and there are territories now open which will prove unusually profitable.

Send in the coupon for full details concerning this new way to make Dollars with American Eagles.

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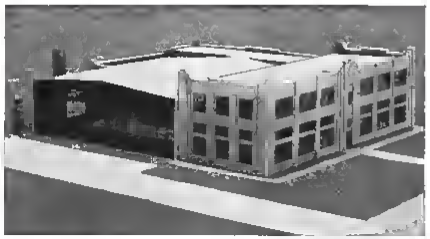

It's Air by U. S. at Cleveland Airport

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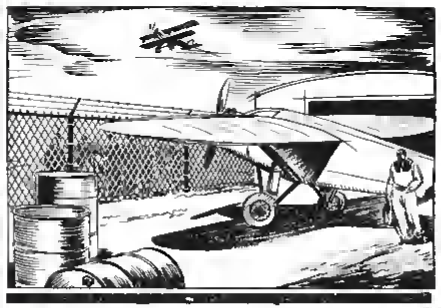

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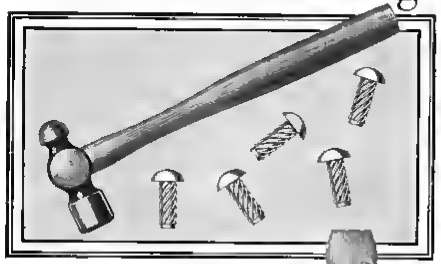

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A Luxurious Chair

A Sure Acting Parachute

A Bouyant Life Preserver

Upholstery now jacket around passenger ready to be dropped

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Floyd Smith Safety Seats in a plane give confidence to passengers . . . a feeling of safety . . . They are sure acting life savers in case of trouble.

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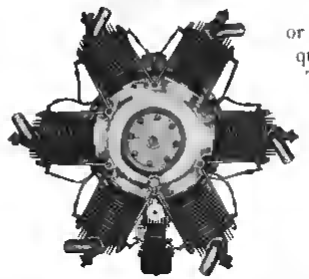

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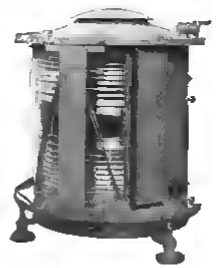

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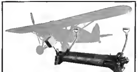

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on Page 41

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WHERE TO FLY

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A bargain Travel Air eleven months old OX-5 motor just overhauled Scintilla magneto Miller overhead installed, 138 hours, licensed ship never cracked up financial difficulties force me to sell asking $2 200 or best offer takes it. Phone between 12 and 5 p.m. Schuyler 1387 B Lichman 100 W 88th St., New York City

AIRPLANE motors Hispano Suiza A 150 hp Hispano Suiza E 180 hp Siemens Halske and Curtiss OX-5 motors all in excellent condition OX-5s at especially attractive prices Write American Eagle Aircraft Corporation Purchasing Agent, Fairfax Airport Kansas City Kansas

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FOR SALE One 60 hp LeBlond Also have number of 60 hp Velie M 5 engines, purchased on large contract Having now adopted 90 hp engines as standard on our Golden Eagle airplanes we are willing to sell these smaller engines which are all new at reduced prices. Golden Eagle Aircraft Corporation 415 East Industrial Avenue, Inglewood Calif.

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FOR SALE Private owned Waco Wright J5 220 Hamilton metal propeller cowling sealion tanks, many other extras, cost $8 000 ninety days ago Thirty two flying hours Like new Beautiful paint job Will sacrifice at $6 800 for quick sale Allen T Simmons W.A.D.C Akron Ohio

FOR SALE Salmson 9 cylinder radial engines Model Z-9 $250 each These engines are completely dismantled and crated completely as received Most of them are new although some have had approximately fifty hours All in good shape complete and serviceable A very dependable engine and the only opportunity today to secure an advanced type of engine at this price Splendid for instruction or experimental purposes Nomusco Motors Inc 871 McKinley Ave Los Angeles Calif.

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72 hour log

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120 hour log

1 OX-5 Travel Air—Duals

All in practically new condition—insured against fire and theft—never been cracked Whirlwinds equipped with Heywood starters—steel propellers

Wire or Write

Dixie Davis Flying Field Corp.
Cincinnati O

FOR SALE New 1929 American Eagle 4 place biplane with spare struts Plane was shipped to New York by freight rigged and just hooked and is ready for delivery Will sacrifice for $3 250 C Robinson, 22 Jackson Street, New Rochelle N Y

FOR SALE Stinson cabin monoplane 6 place J 5 Wright Whirlwind motor Just had factory top overhaul used less than 100 hours perfect condition $6 000 for quick sale Gates Flying Service 1440 Broadway New York

FOR SALE All parts for J 1 Standard, also rebuilt OXX 2 Curtiss motor propeller landing gear tires wheels wings, fuselage and instruments Write for price. Ben Eisenman Sheboygan Wis.

FOR SALE Travel Air biplane OX 5 re-covered this year motor recently overhauled a bargain at $1 750 Yellow Cab Airways Inc Des Moines Iowa

FOR SALE One used Hamilton propeller for OX 5 good shape and retipped for $35 One new 1929 Waco 10 with new Hammondsport OX 5 motor with roller rockers Turns 1 425 geared with Hartzell propeller Never cracked has 40 hours license C6930 will sacrifice for $2 350 Terms Wire Woodriver Air College Woodriver Ill. c/o Everett E Wiegand

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FOR SALE Curtiss H-6 motor $450 also four-place monoplane wings, ailerons fuselage tail and wing struts. Cheap Going out of business Maynard Ravsill 140 E Lake St., Minneapolis, Minn.

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HEATH Parasol with Anzani 3-cylinder motor in A-1 shape 3 hours since complete overhaul mechanical valves $450 for quick sale Stewart Lee Montrose Colorado

J-5 straight wing Waco, new in every respect engine has less than 25 hours Will give factory new ship guarantee Must sell for $6 000 Consider OX 5 Waco in trade Robert Voss Lake Geneva Wis

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LICENSE new production OX 5 Eaglerock 61 less hours since top overhaul $1 500 Buying larger ship Wire Emery C Cater 4709 Chowen Avenue Minneapolis Minn

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1928 OX-5 American Eagle biplane ship and motor in excellent condition for quick sale $1 400 Dixie Airways, Inc 523 Jefferson St., Rocky Mount N C

ONE new Cessna A W Warner cabin monoplane has been used thirty hours Owner must sell on account of not obtaining pilot's license Price $5 000 Can be seen at Palwaukee Airport, Mount Prospect Ill Address L Bjorndahl in care of Palwaukee Airport

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These are in excess of production requirements, and are in original cases. Last production run and never used Complete information and price on request

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Name of Ship	Type	Open or Cabin	No. of pass.	Ship No.	Motor No. of Hours	Ship Time	Price as is Fly Away Location
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Completely rebuilt and overhauled recently Many extras.							
WACO 10	Bi	Open		NC7445	316 hrs.	316 hrs.	5800 00
Wright J-5 Engine Many extras, special paint. Recently rebuilt and overhauled.							
WACO 10	Bi	Open		NC7513	28 hrs. 13 min.	243 hrs.	2000 00
Standard color rebuilt OX5 engine.							
WACO 10	Bi	Open		NC7516	45 hrs.	204 hrs.	2000 00
Standard color rebuilt OX5 engine.							
WACO 10	Bi	Open		NC7517	37 hrs.	148 hrs.	2200.00
Special color combination extras							
WACO 10	Bi	Open		NC8555	37 hrs 33 min	105 hrs.	2400.00
New motor installed.							
WACO 10	Bi	Open		NC8588	48 hrs.	48 hrs.	2600.00
Brand new 1929 model.							
WACO 10	Bi	Open		NC5180	65 hrs. since overhaul.	135 hrs.	1700.00
Maroon fuselage silver wings.							
WACO 10	Bi	Open		NC1066	OX5 Engine		1500.00
WACO 6	Bi	Open		NC1513	15 hrs. since overhaul.	185 hrs.	1500 00
Special color							
TRAVEL AIR	Bi	Open		NC1083			2000 00
AVRO AVIAN	Bi	Open		NC675 B	34 hrs. 43 min	34 hrs.	3200 00
Special color							

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Two Bargains!

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5 place, long wing. Suitable for private individual—sale subject to certain restrictions as to use. Good condition—very little use For sale, less motor (J-5 motor will be installed free of charge)—Complete instruments—Price $2,000

Both ships are available for inspection and immediate delivery in St Louis.

FS 284, 520 No Michigan Ave, Chicago, Ill

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Karl Ort, York, Pa.

FOR SALE AT A BARGAIN

Tapered Wing Waco

This ship was Maj. John P Woods personal racing ship.

Wire for price and details.

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Wausau Wis.

FOR SALE

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WACO 10 brand new motor just overhauled new valve guides and oversize valves Miller intake motor turns 1 440 on the ground New Hamilton propeller and Paragon spare Ship never cracked up or hurt Less than 400 hours Fire hands off Price for cash $1 750 Lendel F Slifer 122 South Main Street Dolgeville New York

WACO 10 Plane is as good as new has had 75 hours Real job must be seen to be appreciated Motor turns 1 400 Priced for quick sale $2 050 J D Whitlow Gilman Illinois

20 000 foot altimeter for your front cockpit No more passengers turning around asking height sign language You are selling flying Do it right A bubble type banking indicator for rear board both for $8.50 postage paid Midway Aero Company P O Box 283 St Paul, Minn

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POSITIONS WANTED

LIMITED commercial pilot Parks Air College graduate Willing to travel anywhere Reasonable salary Age 19 Chester E Sawicki 1544 N 6th St St Louis Mo

PILOT rullicensed ex naval officer 250 certified hours Will go anywhere Prefer to connect with individual PW 281 Aviation Tenth Ave at 36th St, New York

TRANSPORT pilot several years' experience airport manager operations manager purchasing agent director of schools previous experience six years sales manager for large corporation age 34 married excellent record best references employed at present available October 15th Prefer position requiring some flying as school work PW 278, Aviation, 520 No Michigan Ave Chicago Ill

TRANSPORT pilot, age 31, four hundred certified hours experience in barnstorming instructor cross-country in several types of ships want steady position employed at present excellent references Melvin W Remender 807 South Third Norfolk Neb

TRANSPORT pilot 2 000 hours, all types, land and water twelve years continuous aviation work air corps reserve regular rated experience airport management transport company operations, airplane sales and service desires position combining flying and other work PW 279 Aviation Tenth Ave at 36th St New York

TRANSPORT pilot now flying mail and passenger run desires change 1 400 hours State all first communication Pilot W Newman Hotel Nogales Ariz

TRANSPORT pilot Plenty of experience especially in Whirlwind stuff Clear record A 1 references desires position preferably in East with some reliable wide-awake company PW 285 Aviation Tenth Ave at 36th St New York

UNLICENSED mechanic desires position as assistant graduate of well known air school High school education best references PW 280 Aviation Tenth Ave at 36th St., New York

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Of Aviation, published weekly at New York, N Y for Oct. 1, 1929.

State of New York }
County of New York } ss.

Before me a Notary Public in and for the State and county aforesaid personally appeared C H Thompson who, having been duly sworn according to law deposes and says that he is the Secretary of the McGraw Hill Publishing Company, Inc. publishers of Aviation and that the following is to the best of his knowledge and belief a true statement of the ownership management (and if a daily paper the circulation), etc of the aforesaid publication for the date shown in the above caption required by the Act of August 24 1912, embodied in section 411 Postal Laws and Regulations printed on the reverse of this form to wit

1 That the names and addresses of the publisher editor managing editor and business managers are: Publisher McGraw-Hill Publishing Company Inc. 10th Ave & 36th St N Y C. Editor, Edward P Warner 10th Ave & 36th St N Y C Managing Editor None Business Manager M H Newton, 10th Ave. & 36th St., N. Y. C.

2 That the owner is: (If owned by a corporation its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock If not owned by a corporation, the names and addresses of the individual owners must be given If owned by a firm, company or other unincorporated concern, its name and address as well as those of each individual member must be given.) McGraw-Hill Publishing Company, Inc. 10th Ave & 36th St N Y C. Stockholders of which are James H McGraw 10th Ave & 36th St N Y C James H McGraw, Jr 10th Ave & 36th St., N Y C James H McGraw James H McGraw Jr and Malcolm Muir, 10th Ave & 36th St N Y C Trustees for Harold W McGraw James H McGraw Jr , Donald C McGraw Curtis W McGraw Curtis W McGraw 370 Seventh Ave N Y C Donald C McGraw, 10th Ave. & 36th St., N Y C Harold W McGraw, 285 Madison Ave N Y C. Joseph H Bragdon 10th Ave & 36th St N Y C Anne Hugus Britton 10th Ave & 36th St., N Y C Mason Britton 10th Ave & 36th St N Y C Edgar Kobak 10th Ave & 36th St., N Y C Grace W Mehren c/o Bankers Trust Co Fifth Ave & 42nd St N Y C J. Malcolm Muir & Guaranty Trust Co of New York 140 Broadway N Y C Trustees for Lida Kelly Muir, F S Weatherby 271 Clinton Road Brookline Mass Edwin S Wilsey, 10th Ave & 36th St N Y C Goldman Sachs & Co 30 Pine Street, N Y C, a Partnership Partners of which are Waddill Catchings 30 Pine Street, N Y C Arthur Sachs 30 Pine Street N Y C Walter E Sachs 30 Pine Street N Y C Howard J Sachs 30 Pine Street, N Y C Sidney J Weinberg 30 Pine Street, N Y C Henry S Bowers 30 Pine Street, N Y C

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4 That the two paragraphs next above giving the names of the owners, stockholders and security holders if any contain not only the list of stockholders and security holders as they appear upon the books of the company but also in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation the name of the person or corporation for whom such trustee is acting is given also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner and this affiant has no reason to believe that any other person association or corporation has any interest direct or indirect in the said stock bonds or other securities than as so stated by him.

5 That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only)

McGRAW HILL PUBLISHING COMPANY INC.
C H THOMPSON Secretary

Sworn to and subscribed before me this 30th day of September 1929
[Seal] H E BEIRNE
Notary Public N Y Co Clk's No 57
Reg No 1884 Kings Co Clk's No 648
Reg No 1083
(My Commission expires March 30 1931)

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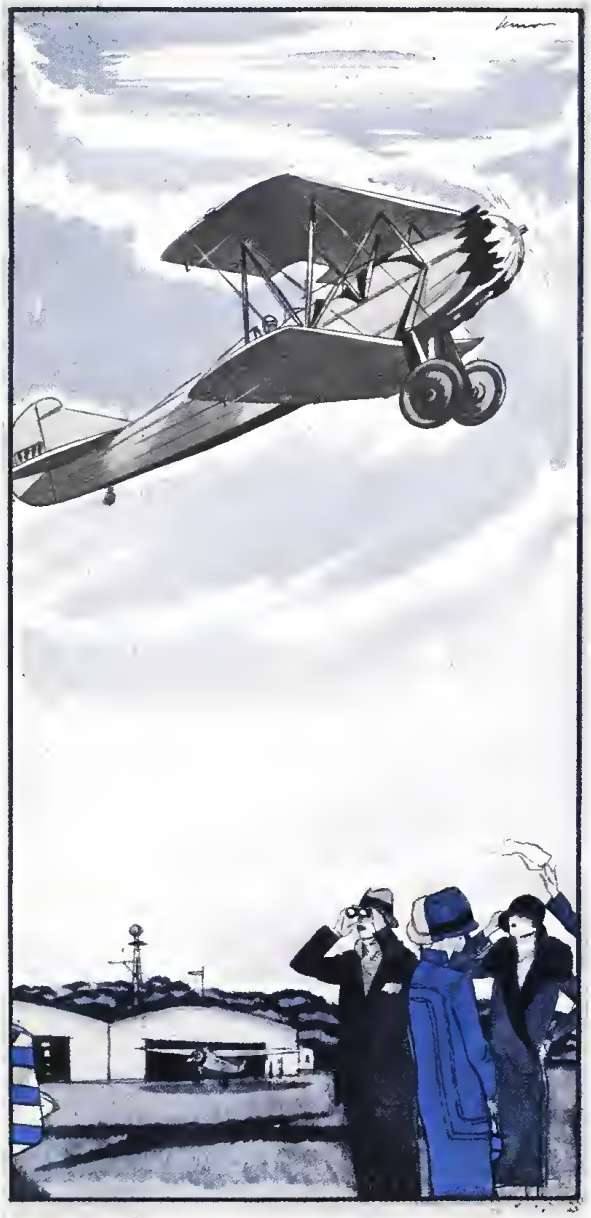
PROFESSIONAL SERVICES

WHERE TO FLY

THE WHIRLWIND J-6 AND ITS DEBUT AT CLEVELAND



THE Cleveland show brought thousands of men nearer to a seat in an airplane . . . it brought thousands of hands a little closer to their place upon the stick.

For the new planes, the new engines, and the new records earned their headlines and their cheers. The new progress of aviation seeped by radio, by eyesight, by printing press and voice to all quarters of the land.

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WRIGHT

AERONAUTICAL CORPORATION

PATERSON, NEW JERSEY